



## **Filing Receipt**

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**Control Number - 55067**

**Item Number - 2**

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

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**STANDARD APPLICATION FOR A CERTIFICATE OF  
CONVENIENCE AND NECESSITY FOR A PROPOSED  
TRANSMISSION LINE**

**DOCKET NO. 55067**

*Submit seven (7) copies of the application and all attachments supporting the application. If the application is being filed pursuant to 16 Tex. Admin. Code §25.101(b)(3)(D) (TAC) or 16 TAC §25.174, include in the application all direct testimony. The application and other necessary documents shall be submitted to:*

**Public Utility Commission of Texas  
Attn: Filing Clerk  
1701 N. Congress Ave.  
Austin, Texas 78711-3326**

Note: As used herein, the term "joint application" refers to an application for proposed transmission facilities for which ownership will be divided. All applications for such facilities should be filed jointly by the proposed owners of the facilities.

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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

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**1. Applicant (Utility) Name:**

**For joint applications, provide all information for each applicant.**

Applicant (Utility) Name: Oncor Electric Delivery Company LLC (“Oncor”)

Certificate Number: 30043

Street Address: 1616 Woodall Rodgers Freeway  
Dallas, Texas 75202

Mailing Address: 1616 Woodall Rodgers Freeway  
Dallas, Texas 75202-1234

**2. Please identify all entities that will hold an ownership interest or an investment interest in the proposed project but which are not subject to the Commission’s jurisdiction.**

Oncor will hold the sole ownership interest in the Ramhorn Hill Switch – Dunham Switch 345 kilovolt (“kV”) Transmission Line Project (the “Proposed Transmission Line Project”).

**3. Person to Contact:** Chris Reily  
Title/Position: Regulatory Manager  
Phone Number: (214) 486-4717  
Mailing Address: 1616 Woodall Rodgers Fwy, Suite 6A-012  
Dallas, Texas 75202-1234  
Email Address: [Chris.Reily@oncor.com](mailto:Chris.Reily@oncor.com)

**3a. Alternate Contact:** Thomas Yamin  
Title/Position: Director of Regulatory, Transmission & Planning  
Phone Number: (214) 486-3512  
Mailing Address: 1616 Woodall Rodgers Fwy, Suite 6B-005  
Dallas, Texas 75202-1234  
Email Address: [Thomas.Yamin@oncor.com](mailto:Thomas.Yamin@oncor.com)

**3b. Legal Counsel:** Jaren A. Taylor

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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

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Jared M. Jones

Phone Number: (214) 220-7754

Mailing Address: Vinson & Elkins LLP  
Trammell Crow Center  
2001 Ross Avenue, Suite 3900  
Dallas, Texas 75201

Email Address: [jarentaylor@velaw.com](mailto:jarentaylor@velaw.com)  
[jjones@velaw.com](mailto:jjones@velaw.com)

Please contact Jaren Taylor with any inquiries regarding the project.

**4. Project Description:**

Provide a general description of the project, including the design voltage rating (kV), the operating voltage (kV), the CREZ Zone(s) (if any) where the project is located (all or in part), any substations and/or substation reactive compensation constructed as part of the project, and any series elements such as sectionalizing switching devices, series line compensation, etc. For HVDC transmission lines, the converter stations should be considered to be project components and should be addressed in the project description.

If the project will be owned by more than one party, briefly explain the ownership arrangements between the parties and provide a description of the portion(s) that will be owned by each party. Provide a description of the responsibilities of each party for implementing the project (design, Right-Of-Way acquisition, material procurement, construction, etc.).

If applicable, identify and explain any deviation in transmission project components from the original transmission specifications as previously approved by the Commission or recommended by a PURA §39.151 organization.

<b>Name or Designation of Project:</b>	Ramhorn Hill Switch – Dunham Switch 345 kV Transmission Line Project
<b>Design Voltage Rating (kV):</b>	345 kV
<b>Operating Voltage Rating (kV):</b>	345 kV
<b>Normal Peak Operating Current (A):</b>	5,138 A

The Proposed Transmission Line Project is a new double-circuit 345 kV transmission line to be built on triple-circuit capable structures between the proposed Ramhorn Hill Switch and the proposed Dunham Switch. The structures will have two 345 kV circuits initially installed with a vacant third circuit position capable of accommodating a future 138 kV circuit.

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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

The proposed Ramhorn Hill Switch will be located approximately 2 miles south of the intersection of United States Highway (“US”) 287 and State Highway (“SH”) 114 near Rhome, Texas. The proposed Dunham Switch will be located approximately 1.4 miles southeast of the intersection of US 377 and Farm-to-Market Road (“FM”) 1171 (regionally known as Cross Timbers Road) in Flower Mound, Texas.

The length of the Proposed Transmission Line Project is approximately 20 to 23 miles, depending on which route is selected by the Public Utility Commission of Texas (“PUCT” or “Commission”).

The Proposed Transmission Line Project includes the construction of the proposed Ramhorn Hill Switch and the proposed Dunham Switch.

**5. Conductor and Structures:**

<b>Conductor Size and Type:</b>	1926.9 kcmil Aluminum Conductor Steel Supported Trapezoidal- Shaped Wire (“ACSS/TW”)
<b>Number of conductors per phase:</b>	2
<b>Continuous Summer Static Current Rating (A):</b>	5,138 A
<b>Continuous Summer Static Line Capacity at Operating Voltage (MVA):</b>	3,070 MVA
<b>Continuous Summer Static Line Capacity at Design Voltage (MVA):</b>	3,070 MVA
<b>Type and composition of Structures:</b>	Triple-Circuit Steel Monopole
<b>Height of Typical Structures:</b>	120 – 175 feet*

\*This number reflects the approximate visible height of the structure from ground to structure top. Please see the drawing of the typical structures in Figure 1-2, page 1-7, of the *Environmental Assessment and Alternative Route Analysis for the proposed Ramhorn Hill Switch Dunham Switch 345 kV Transmission Line Project in Denton and Wise Counties, Texas for Oncor Electric Delivery Company LLC* (“Environmental Assessment and Routing Study”), prepared by Halff Associates, Inc. (“Halff”) and included as Attachment No. 1.

**Explain why these structures were selected; include such factors as landowner preference, engineering considerations, and costs comparisons to alternate structures that were considered.**

**For joint applications, provide and separately identify the above-required information regarding structures for the portion(s) of the project owned by each applicant.**

Oncor selected the triple-circuit capable 345 kV steel monopole for numerous reasons including technical specifications, the compact structure footprint, reduced right-of-way

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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

("ROW") width requirements, the specific characteristics of the study area, the ability to accommodate a future 138 kV circuit, and other engineering-related reasons.

**Provide dimensional drawings of the typical structures to be used in the project.**

A drawing of the typical structure is shown in Figure 1-2, page 1-7, of the Environmental Assessment and Routing Study included as Attachment No. 1.

**6. Right-of-way:**

**For joint applications, provide and separately identify the above-required information for each route for the portion(s) of the project owned by each applicant.**

<b>Miles of Right-of-Way</b>	Approximately 19.9 to 22.9 miles
<b>Miles of Circuit</b>	Approximately 39.8 to 45.8 miles
<b>Width of Right-of-Way</b>	100 feet
<b>Percent of Right-of-Way Acquired</b>	0%

**Provide a brief description of the area traversed by the transmission line. Include a description of the general land uses in the area and the type of terrain crossed by the line.**

The project area is situated within Denton and Wise Counties and has numerous incorporated cities contained within, or extending into, the project area. A great proportion of the project area is currently vacant land, consisting primarily of grassland and agricultural areas, yet the area is developing rapidly. Urbanized areas are generally clustered along major transportation corridors such as Interstate Highway ("IH") 35W, US 377, US 287, FM 156 and SH 114. Much of the existing vacant property in the project area is being converted to master planned residential communities and for commercial and industrial uses. Existing residential communities and subdivisions are located in pockets throughout the project area. Existing commercial and industrial development is also spread throughout the project area, but is mostly concentrated near the IH 35W, US 377, and SH 114 corridors in the southern portion of the project area.

Several federal recreational areas associated with Lake Grapevine, the Denton Creek floodplain, and the Denton Creek's tributaries extend into the eastern third of the project area. The United States Army Corps of Engineers ("USACE") owns and manages Lake Grapevine and the surrounding federal management areas. The Denton Creek "Environmentally Sensitive Area," as identified by the USACE, comprises most of the USACE recreational area in the eastern third of the project area. This area is a large contiguous band of high-quality habitat for numerous species of wildlife.

South and west of the USACE property, in the area surrounding the intersection of IH 35W and SH 114, the project area contains dense urban/suburban development, including numerous residential subdivisions, commercial and industrial business parks, transportation/logistics operations, recreational facilities, the Texas Motor Speedway, Fort Worth Alliance Airport, and the BNSF Railway Company Intermodal Rail Yard.

---

June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

Specific discussion regarding natural, human, and cultural resources in the project area is set forth in Sections 3.1 through 3.8, pages 3-1 through 3-92, of the Environmental Assessment and Routing Study, included as Attachment No. 1.

**7. Substations or Switching Stations:**

**List the name of all existing HVDC converter stations, substations or switching stations that will be associated with the new transmission line. Provide documentation showing that the owner(s) of the existing HVDC converter stations, substations and/or switching stations have agreed to the installation of the required project facilities.**

Not Applicable.

**List the name of all new HVDC converter stations, substations or switching stations that will be associated with the new transmission line. Provide documentation showing that the owner(s) of the new HVDC converter stations, substations and/or switching stations have agreed to the installation of the required project facilities.**

Oncor Proposed Ramhorn Hill Switch

The proposed Ramhorn Hill Switch will be located approximately 2 miles south of the intersection of US 287 and SH 114 near Rhome, Texas. In order to establish the new 345 kV switchyard as part of the Proposed Transmission Line Project, Oncor will terminate the existing double-circuit Hicks to Willow Creek 345 kV transmission line into the proposed switch station. The switchyard will initially be constructed in a 12-breaker, breaker-and-a-half bus arrangement. Relay panels, SCADA and controls for the 345 kV switchyard equipment will be housed in a control center. The dimensions of the proposed Ramhorn Hill Switch station will be approximately 700 feet by 750 feet. Ultimately, the proposed Ramhorn Hill Switch station site could be expanded to accommodate an 18-breaker, 345 kV ring bus arrangement and a potential 138 kV switchyard. The dimensions and additional details regarding the proposed preliminary layout of the Ramhorn Hill Switch station are illustrated in Attachment No. 2.

Oncor Proposed Dunham Switch

The proposed Dunham Switch will be located approximately 1.4 miles southeast of the intersection of US 377 and FM 1171 (regionally known as Cross Timbers Road) in Flower Mound, Texas. In order to establish the new 345 kV switchyard as part of the Proposed Transmission Line Project, Oncor will terminate the existing Lewisville to Krum West and Lewisville to Roanoke 345 kV transmission lines into the proposed switch station. The switchyard will initially be constructed in a 12-breaker, breaker-and-a-half bus arrangement. Relay panels, SCADA, and controls for the 345 kV switchyard equipment will be housed in a control center. The dimensions of the proposed Dunham Switch station

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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

will be approximately 700 feet by 600 feet. Ultimately, the proposed Dunham Switch station site could be expanded to accommodate an 18-breaker, 345 kV ring bus arrangement and a potential 138 kV switchyard. The dimensions and additional details regarding the proposed preliminary layout of the Dunham Switch station are illustrated in Attachment No. 2.

**8. Estimated Schedule:**

<b><u>Estimated Dates of:</u></b>	<b><u>Start*</u></b>	<b><u>Completion*</u></b>
Right-of-way and Land Acquisition	12/2023	12/2024
Engineering and Design	01/2024	10/2024
Material and Equipment Procurement	2/2024	10/2024
Construction of Facilities	12/2024	12/2025
Energize Facilities	12/2025	12/2025

\*Dates are based on 180-day CCN process due to ERCOT critical designation.

**9. Counties:**

**For each route, list all counties in which the route is to be constructed.**

Wise County  
Denton County

**10. Municipalities:**

**For each route, list all municipalities in which the route is to be constructed.**

Portions of the proposed alternative routes will be constructed within the city limits of the following municipalities:

<b>Cities (East to West)</b>	<b>Routes</b>
Flower Mound	All Filed Routes
Northlake	All Filed Routes
Justin	1, 19, 29, 33, 36, 41, 42, 54, 65, 67, 68, 69, 71, 72, 86, 92, 94, 96, 103, 108, 116, 130, 132, 137, 138, 142, 143, 146, 154, 170, 175, 176, 178, 179, 184, 185, 186, 187, 191, 192, 207, 216, 217, 218, 219, 221
Fort Worth	3, 5, 10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 28, 29, 43, 44, 58, 61, 63, 70, 78, 87, 116, 117, 119, 130, 132, 164, 179, 199, 200
New Fairview	67, 68, 69
Rhome	1, 11, 26, 33, 41, 42, 65, 67, 68, 69, 71, 72, 86, 92, 94, 96, 103, 117, 138, 142, 143, 154, 175, 176, 178, 184, 185, 192, 207, 216, 218

June 8, 2023



**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

For each applicant, attach a copy of the franchise, permit or other evidence of the city's consent held by the utility, if necessary or applicable. If franchise, permit, or other evidence of the city's consent has been previously filed, provide only the docket number of the application in which the consent was filed. Each applicant should provide this information only for the portion(s) of the project which will be owned by the applicant.

To the extent necessary or appropriate, evidence of consent for service in this area is publicly available and previously filed in PUCT Docket No. 45.

**11. Affected Utilities:**

Identify any other electric utility served by or connected to facilities in this application.

No other electric utility will be served by or connected to the Proposed Transmission Line Project.

Describe how any other electric utility will be affected and the extent of the other utilities' involvement in the construction of this project. Include any other electric utilities whose existing facilities will be utilized for the project (vacant circuit positions, ROW, substation sites and/or equipment, etc.) and provide documentation showing that the owner(s) of the existing facilities have agreed to the installation of the required project facilities.

No other electric utility will be involved in the construction of the Proposed Transmission Line Project, and no other electric utility's facilities will be utilized.

**12. Financing:**

Describe the method of financing this project. For each applicant that is to be reimbursed for all or a portion of this project, identify the source and amount of the reimbursement (actual amount if known, estimated amount otherwise) and the portion(s) of the project for which the reimbursement will be made.

Oncor proposes to finance the facilities included in the Proposed Transmission Line Project with a combination of debt and equity in compliance with its authorized capital structure, which is similar to the means used for previous construction projects. Oncor plans to utilize internally generated funds (equity) and proceeds received from the issuance of securities. Oncor will typically obtain short-term borrowings as needed for interim financing of its construction expenditures in excess of funds generated internally. These borrowings are then repaid through the issuance of long-term debt securities, the type and amount of which are as of yet undetermined.

Oncor is the sole applicant and, therefore, no other party will be reimbursed for any portion of the Proposed Transmission Line Project.

**13. Estimated Costs:**

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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

Provide cost estimates for each route of the proposed project using the following table. Provide a breakdown of "Other" costs by major cost category and amount. Provide the information for each route in an attachment to this application.

	<u><b>Transmission Facilities</b></u>	<u><b>Station Facilities</b></u>	
		Ramhorn Hill Switch	Dunham Switch
Right-of-way and Land Acquisition	*	\$ 8,810,000	\$ 16,648,000
Engineering and Design (Utility)	*	\$ -	\$ -
Engineering and Design (Contract)	*	\$ 500,000	\$ 500,000
Procurement of Material and Equipment (including stores)	*	\$ 11,570,000	\$ 11,570,000
Construction of Facilities (Utility)	*	\$ 250,000	\$ 250,000
Construction of Facilities (Contract)	*	\$ 12,380,000	\$ 12,380,000
Other (all costs not included in the above categories)	*	\$ -	\$ -
<b>Estimated Total Cost</b>	*	<b>\$ 33,510,000</b>	<b>\$ 41,348,000</b>

\*Refer to Attachment No. 3 for cost estimates for each alternative route presented in the Application.

For joint applications, provide and separately identify the above-required information for the portion(s) of the project owned by each applicant.

Not applicable.

**14. Need for the Proposed Project:**

For a standard application, describe the need for the construction and state how the proposed project will address the need. Describe the existing transmission system and conditions addressed by this application. For projects that are planned to accommodate load growth, provide historical load data and load projections for at least five years. For projects to accommodate load growth or to address reliability issues, provide a description of the steady state load flow analysis that justifies the project. For interconnection projects, provide any documentation from a transmission service customer, generator, transmission service provider, or other entity to establish that the proposed facilities are needed. For projects related to a Competitive Renewable Energy Zone, the foregoing requirements are not necessary; the applicant need only provide a specific reference to the pertinent

June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

portion(s) of an appropriate commission order specifying that the facilities are needed. For all projects, provide any documentation of the review and recommendation of a PURA §39.151 organization.

**Overview**

The Proposed Transmission Line Project is needed to address reliability issues identified in post-contingency conditions. ERCOT designated this project as “critical to reliability” under 16 TAC § 25.101(b)(3)(D).

The Roanoke area, located approximately 15 miles north of Fort Worth, is one of the highest growth areas in the DFW Metroplex. The 345 kV transmission system in this area is part of a high-power transfer corridor connecting generation in the Panhandle to the DFW load center. The power transfer and load-serving capabilities of the system in this area depend on facilities developed as part of the Competitive Renewable Energy Zone, many of which are approaching their operating limits at current demand levels. Capacity limitations in the area are already limiting the development of new large-point loads. In the last 18 months, Oncor received several requests for interconnection in this area that Oncor was limited in its ability to fulfill due to prospective autotransformer and line overloads. Growth in the area will continue to increase demand and strain the transmission system. This necessitates additional transmission capacity to preserve reliability without overloading the existing transmission system or causing voltage support issues that could threaten system stability.

Oncor performed power flow studies and contingency analysis in accordance with NERC Reliability Standard TPL-001-4 and the ERCOT Planning Guide. This analysis identified post-contingency system performance issues beginning in summer 2023, including thermal overloads, loading limitations, and voltage criteria exceedances.

The Proposed Transmission Line Project is the second in a series of projects, collectively called the “Roanoke Area Upgrades Project,” that will address the identified reliability issues and provide additional operational flexibility on the transmission system in the Roanoke area. ERCOT reviewed the Roanoke Area Upgrades Project, including the Proposed Transmission Line Project, and endorsed it as a Tier 1 transmission project that is critical to the reliability of the ERCOT system.

**Thermal Overloads**

Starting in summer 2023, the 345/138 kV autotransformers at Hicks and Roanoke and the Roanoke – Hicks 345 kV transmission line will exceed their emergency ratings under contingency conditions. Tables 1 and 2 below summarize the current configuration and resulting thermal overloads under N-1 (loss of a single generator or transmission element) and N-1-1 (loss of a generator or transmission element following an N-1 event) contingency events, as respectively defined in NERC TPL-001-4 Reliability Standard and the ERCOT Planning Guide. Overloading is shown as a percentage of an element’s emergency rating. These tables were created using ERCOT’s 2021 Regional Transmission Plan for the North and North Central weather zones (“2021 RTP NNC Cases”) and 2021 Steady State Working Group (“SSWG”) cases.

---

June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

Monitored Element	Worst Contingency (N-1)	Worst Contingency Loading (% of Emergency Rating)					
		2021 RTP NNC Cases			2021 SSWG Cases		
		2023	2024	2026	2027	2024	2028
Roanoke 345/138 kV Autotransformer #1	Roanoke 345/138 kV Autotransformer #2 (P1.3)	92	94	96	96	101	110
Roanoke 345/138 kV Autotransformer #2	Roanoke 345/138 kV Autotransformer #1 (P1.3)	94	95	98	98	101	110
Roanoke – Hicks 345 kV double-circuit line	Loss of either Roanoke – Hicks 345 kV circuit (P1.2)	89	87	91	93	99	107

**Table 1 – Pre-project post N-1 contingency loading**

**Table 2 – Pre-project post N-1-1 contingency loading**

Monitored Element	Worst Contingency (N-1-1)	Worst Contingency Loading (% of Emergency Rating)					
		2021 RTP NNC Cases			2021 SSWG Cases		
		2023	2024	2026	2027	2024	2028
Roanoke 345/138 kV Autotransformer #1	Roanoke 345/138 kV Autotransformer + Roanoke – West Denton/Lewisville 345 kV double-circuit line (ERCOT Requirement)	111	110	114	114	124	135
Roanoke 345/138 kV Autotransformer #2		111	110	114	114	124	135
Hicks 345/138 kV Autotransformer #1	Hicks 345/138 kV Autotransformer + Hicks – Alliance/Roanoke 345 kV double-circuit line (ERCOT Requirement)	99	98	101	102	113	123
Hicks 345/138 kV Autotransformer #2		100	99	102	104	113	123
Hicks – Roanoke 345 kV line	Panda Sherman Train and either Hicks – Roanoke 345 kV circuit (P3.2)	95	93	97	99	104	113

Line Loading Limitations

Under peak load conditions, the Roanoke – Deen/Euless 138 kV double-circuit transmission line currently serves nearly 1,000 MW of load, as shown in Table 3. Planning criteria exceedances were observed following a NERC P2.1 contingency, where (1) the loss of the Euless Switch – Bedford Woodson Tap 138 kV line (one section of the overall Roanoke – Deen/Euless transmission line) results in the Roanoke – Park Vista line section (east circuit) loading to 102% of its operating limit in the 2021 SSWG 2024 summer peak case, and (2) the loss of the Deen Switch – Watauga 138 kV line (also a section of the overall Roanoke – Deen/Euless transmission line) results in Roanoke – Park Vista line section (west circuit) loading to 102% of its operating limit in the 2021

June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

SSWG 2027 summer peak case. The Roanoke – Deen/Eulesse double circuit transmission line is approaching its loading limit, which will restrict Oncor’s ability to serve projected load growth in this area in the coming years. The coincident peak load in the Roanoke area between 2017 and 2020 has grown at an annual rate of ~3.1%, which is about double the annual growth rate of Oncor’s overall coincident peak during this same period. Table 3 lists forecasted load on the Roanoke – Deen/Eulesse double circuit transmission line through 2028.

Line	2022	2023	2024	2025	2026	2027	2028
Roanoke – Deen	471	478	494	500	504	517	527
Roanoke – Eulesse	474	481	509	516	523	536	546
Total	945	959	1003	1016	1027	1053	1073

**Table 3 – Forecasted load on Roanoke – Deen/Eulesse double-circuit line (MW)**

Voltage Criteria Exceedances

Starting in 2028, with the loss of Handley Unit #5 followed by the Roanoke – Park Vista 138 kV line section, several buses on the Roanoke – Deen 138 kV transmission line experience voltages are nearing or outside their emergency limits as shown in Table 4 (emergency limits for all listed elements are <0.90 or <0.92).

Bus Number	Bus Name	Post Contingency Voltage (in p.u.)	Voltage Limit
15100	PARKVISTA1_8	0.890	0.9
2058	CIRCLET_P8	0.892	0.9
559	HERITAGE	0.893	0.92
12033	HRTAG1_T8	0.893	0.9
2036	KELLER2_T8	0.894	0.9
33565	KELLER2	0.894	0.9
2033	KLR_MAG1_T8	0.895	0.9
2037	WPKELLR1_8	0.899	0.9
566	CHERRYGROV	0.900	0.92
2035	BEARCK3_8	0.902	0.9
12028	CLYVIL2_8	0.905	0.9
2028	CLYVIL2_T8	0.906	0.9

**Table 4 – Post Contingency Voltage Criteria Exceedances**

To address these reliability issues, Oncor recommended the Roanoke Area Upgrades Project to the ERCOT Regional Planning Group (“RPG”). ERCOT conducted an

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

independent review, which also identified reliability issues in the area, including thermal overloads and voltage violations. Tables 5 and 6 below summarize ERCOT's findings.

NERC Contingency Category	Overloaded Element	Voltage Level (kV)	Length (miles)	Loading %
P1: N-1	Roanoke Transformer #1 and #2	345/138	-	101.68
P6: (X-1 – N-1)	Roanoke Transformer #1 and #2	345/138	-	117.27
P6: (X-1 – N-1)	Hicks Transformer #1 and #2	345/138	-	100.00
P3: (G-1 – N-1)	Hicks to Roanoke	345	9.6	100.73
P3: (G-1 – N-1)	Hicks to Alliance	345	5.8	100.28
P6: (X-1 – N-1)	Kennedale to Century	345	10.5	100.69
P6: (X-1 – N-1)	Randol Mill Tap East to Randol Mill	138	2.2	100.63
P6: (X-1 – N-1)	Liggett Switch to DFW E East	138	3.0	100.96
P6: (X-1 – N-1)	Liggett Switch to Irving Valley View	138	1.5	104.96

**Table 5 – Thermal Overloads Observed in the Study Area for 2026 Summer Peak**

NERC Contingency Category	Substation	Voltage Level (kV)	Post-Contingency Voltage (pu)
P3: (G-1 – N-1)	Park Vista	138	0.89
P3: (G-1 – N-1)	Keller Tap	138	0.90
P3: (G-1 – N-1)	Keller Magnolia Tap	138	0.90
P6: (X-1 – N-1)	Heritage	138	0.90
P3: (G-1 – N-1)	Cherry Grove	138	0.90

**Table 6 – Voltage Violations Observed in the Study Area for 2026 Summer Peak**

After conducting an independent review, ERCOT's RPG, Technical Advisory Committee, and Board of Directors approved the Roanoke Area Upgrades Project, which included the following:

1. Construct a new Ramhorn Hill 345 kV switching station in a 10-breaker, breaker-and-a-half arrangement tapped into the existing double-circuit Hicks to Willow Creek 345 kV line. The existing Hicks and Willow Creek substations are owned by Oncor.
2. Construct a new Dunham 345 kV switching station in a 10-breaker, breaker-and-a-half arrangement tapped into the existing Lewisville to Krum West and Lewisville to Roanoke 345 kV lines. The existing Lewisville Substation is owned by Brazos Electric Cooperative. The existing Krum West and Roanoke Substations are owned by Oncor.
3. Construct two new Ramhorn Hill to Dunham 345 kV transmission lines, with conductor rated to at least 2987 MVA, in a new (estimated 18.4-mile) right-of-way, installed on new triple-circuit towers leaving one vacant 138 kV position.

June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

4. Rebuild Exchange to Roanoke 345 kV double-circuit lines, upgrading both with conductors rated to at least 2987 MVA, using separate double-circuit capable structures for each line. The line ratings will be 1912/1912 MVA, limited by terminal equipment at Roanoke.
5. Construct a new Exchange to Roanoke 138 kV circuit, with conductor rated to at least 764 MVA, using one of the Exchange to Roanoke 345 kV line double-circuit capable structures.
6. Construct a new Exchange 345/138 kV Switching Station, adjacent to the Alliance 345 kV substation, with two new 600 MVA (nameplate) transformers in an 8-breaker, 345 kV breaker-and-a-half bus arrangement and a 9-breaker, 138 kV breaker-and-a-half arrangement. The normal/emergency ratings of the new transformers will be 700/750 MVA. Exchange will be connected to Hicks and Roanoke with 345 kV lines and connected to the converted Alliance Substation with 138 kV lines. The existing Alliance and Hicks Substations are owned by Oncor.
7. Convert the existing Alliance 345 kV load-serving substation to 138 kV load-serving operation.
8. Construct a new Exchange to Alliance 138 kV double-circuit line with conductors rated to at least 746 MVA.
9. Construct a new Alliance to Keller Magnolia and Alliance to Heritage 138 kV double-circuit line with conductors rated to at least 746 MVA in a new (estimated 1.4-mile) right-of-way. The existing Keller Magnolia and Heritage Substations are owned by Oncor.
10. Upgrade the existing Keller Magnolia to Heritage 138 kV line with conductor rated to at least 746 MVA to be installed on the Alliance to Keller Magnolia and Alliance to Heritage 138 kV double-circuit structures.
11. Upgrade the existing Heritage to Keller Magnolia Tap double-circuit lines with conductors rated to at least 746 MVA.
12. Construct a new 138 kV switching station at Keller Wall Price in a 6-breaker ring bus arrangement.
13. Disconnect the double-circuit Heritage to Keller Magnolia Tap lines at Keller Magnolia Tap and terminate both at Keller Wall Price by constructing two new 0.3-mile, 138 kV transmission lines added to the existing Keller Magnolia Tap to Keller Wall Price right-of-way with both new line conductors rated to at least 746

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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

MVA. The existing Keller Magnolia Tap and Keller Wall Price Substation are owned by Oncor.

14. Retire the Keller Magnolia Tap.

The Proposed Transmission Line Project includes components 1, 2, and 3 of the overall Roanoke Area Upgrades Project, as listed above. Both the Ramhorn Hill and Dunham switching stations were conceptualized and proposed to have 10 breakers as an initial configuration. However, after finalizing property locations and station layouts, Oncor is proposing to install 12 breakers as an initial configuration at both switching stations. A 12-breaker initial configuration at Ramhorn Hill and Dunham is better suited to accommodate future system growth while avoiding future line rework, congested 345 kV crossings, and extended outages when the switching stations are expanded to accommodate additional transmission lines in the future.

Oncor filed Commission Docket No. 54733 to amend its CCN for components 12, 13, and 14. Oncor will file separate CCN applications for the remaining components of the Roanoke Area Upgrades Project as required by the Commission.

The complete ERCOT Independent Review, dated July 19, 2022, is included as Attachment No. 4 to the Application. A system map showing all of the recommended Roanoke upgrades is included as Attachment No. 5.

15. **Alternatives to Project:**

For a standard application, describe alternatives to the construction of this project (not routing options). Include an analysis of distribution alternatives, upgrading voltage or bundling of conductors of existing facilities, adding transformers, and for utilities that have not unbundled, distributed generation as alternatives to the project. Explain how the project overcomes the insufficiencies of the other options that were considered.

**Oncor Review**

Oncor evaluated 3 alternatives to address the identified reliability concerns described in response to Question No. 14:

**Oncor Option #1 (O1):**

- Establish the Exchange 345/138 kV Switching Station, adjacent to Alliance 345 kV Substation, with two 600 MVA Autotransformers in a 8-breaker 345 kV breaker-and-a-half bus arrangement and a 9-breaker 138 kV breaker-and-a-half arrangement
- Convert the existing Alliance 345 kV load-serving substation to 138 kV operation
- Establish the Exchange – Keller Wall Price 138 kV double-circuit line using a conductor rated at least 3121 A or greater with the following upgrades:

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June 8, 2023



**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

- Construct the Exchange – Keller Magnolia 138 kV double-circuit line
- Upgrade the Keller Magnolia – Keller Wall Price Switch 138 kV line using double-circuit capable structures
- Establish a new 138 kV switching station at Keller Wall Price in a 6-breaker ring bus arrangement
- Disconnect the Keller Magnolia Tap – Heritage/Keller Magnolia line at Keller Magnolia Tap and terminate at Keller Wall Price by constructing a new 0.3-mile double-circuit 138 kV transmission line
- Establish the Ramhorn Hill 345 kV switching station in a 10-breaker, breaker-and-a-half arrangement
- Establish Dunham 345 kV switching station with in a 10-breaker, breaker-and-a-half arrangement
- Construct an estimated 18.4-mile triple-circuit line between Ramhorn Hill and Dunham with:
  - Two 345 kV circuits using conductor rated at least 5000 A
  - A vacant position for a future 138 kV circuit to support future load serving substations in growth areas
- Rebuild Exchange – Roanoke 345 kV double-circuit line using separate double-circuit capable structures for each line with conductor rated at least 5000 A and establish the Exchange – Roanoke 138 kV circuit using one of the Exchange – Roanoke 345 kV line double-circuit capable structures rated at least 3200 A
- Ensure all new 345 kV terminals at Exchange, Ramhorn Hill, and Dunham are rated 5000 A and 138 kV terminals at Exchange, Keller Wall Price, and Roanoke are rated 3200 A

Oncor Option #2 (O2):

- Establish Dunham 345 kV switching station in an 8-breaker, breaker-and-a-half arrangement
- Establish Dunham 138 kV switching station in a 5-breaker, breaker-and-a-half arrangement
- Establish two new 345/138 kV autotransformers at the proposed Dunham 345 kV switching station
- Construct an estimated 1-mile, 138 kV double-circuit line from Dunham to Cross Timbers with conductor rated 3200 A or greater

Oncor Option #3 (O3):

- Establish the Ramhorn Hill 345 kV switching station in a 10-breaker, breaker-and-a-half arrangement
  - Establish Dunham 345 kV switching station in an 11-breaker, breaker-and-a-half arrangement
  - Construct an estimated 18.4-mile, 345 kV double-circuit line from Ramhorn Hill to Dunham with conductor rated 5000 A or greater
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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

- Establish Dunham 138 kV switching station in a 5-breaker, breaker-and-a-half arrangement
- Establish two new 345/138 kV autotransformers at the proposed Dunham 345 kV switching station
- Construct an estimated 1-mile, 138 kV double-circuit line from Dunham to Cross Timbers with conductor rated 3200 A or greater

Of the three alternatives Oncor reviewed, Option #1 best addressed the identified reliability issues. While both Option #2 and Option #3 would reduce some post-contingency thermal overloads, the steady-state analysis clearly demonstrates that Option #1 would more effectively address thermal overloads, resolving overloads across all case years. Option #1 also resolves load-serving limitations and voltage criteria exceedances on the Roanoke – Euless/Deen double-circuit transmission line, whereas Options #2 and #3 do not. The results of Oncor’s analysis are summarized in Tables 7, 8, and 9 below.

Element	Worst Contingency Loading (% of Emergency Rating)															
	2021 RTP NNC Cases															
	2023 Summer				2024 Summer				2026 Summer				2027 Summer			
	Base	O1	O2	O3	Base	O1	O2	O3	Base	O1	O2	O3	Base	O1	O2	O3
Roanoke 345/138 kV Autotransformer #1	111	74	107	84	110	73	106	88	114	75	109	91	114	75	109	91
Roanoke 345/138 kV Autotransformer #2	111	74	108	84	110	73	106	88	114	75	109	91	114	75	109	91
Hicks 345/138 kV Autotransformer #1	99	66	96	72	98	65	95	71	101	66	98	72	102	66	99	72
Hicks 345/138 kV Autotransformer #2	100	66	98	72	99	66	96	72	102	67	99	73	104	67	101	73
Roanoke – Hicks 345 kV line	95	71	97	57	93	71	95	56	97	73	98	58	99	75	100	59
Performance Requirements Met		Yes	No	Yes		Yes	No	Yes		Yes	No	Yes		Yes	No	Yes

**Table 7 – Post Contingency Loading Comparison using RTP NNC Cases**

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

Element	Worst Contingency Loading (% of Emergency Rating) in 2021 SSWG Cases							
	2024 Summer				2028 Summer			
	Base	O1	O2	O3	Base	O1	O2	O3
Roanoke 345/138 kV Autotransformer #1	124	82	121	95	135	89	131	103
Roanoke 345/138 kV Autotransformer #2	124	82	121	95	135	89	131	103
Hicks 345/138 kV Autotransformer #1	113	74	110	80	123	79	120	85
Hicks 345/138 kV Autotransformer #2	113	74	110	80	123	79	120	85
Roanoke – Hicks 345 kV line	104	79	105	62	113	86	114	67
Performance Requirements Met		Yes	No	Yes		Yes	No	No

**Table 8 – Post Contingency Loading Comparison using 2021 SSWG Cases**

Bus Number	Bus Name	Worst Contingency Voltage Results (in p.u.) 2028 Summer (2021 SSWG Case)			
		Base	O1	O2	O3
15100	PARKVISTA1_8	0.890	>0.95	0.893	0.897
2058	CIRCLET_P8	0.892	>0.95	0.895	0.898
559	HERITAGE	0.893	>0.95	0.896	0.900
12033	HRTAG1_T8	0.893	>0.95	0.896	0.900
2036	KELLER2_T8	0.894	>0.95	0.897	0.901
33565	KELLER2	0.894	>0.95	0.897	0.901
2033	KLR_MAG1_T8	0.895	>0.95	0.899	0.902
2037	WPKELLR1_8	0.899	>0.95	0.903	0.906
566	CHERRYGROV	0.900	>0.95	0.903	0.906
2035	BEARCK3_8	0.902	>0.95	0.905	0.909
12028	CLYVIL2_8	0.905	>0.95	0.908	0.911
2028	CLYVIL2_T8	0.906	>0.95	0.909	0.912
Performance Requirements Met			Yes	No	No

**Table 9 – Post Contingency Voltage Comparison using 2021 SSWG Case**

After identifying Option #1 as the superior option, Oncor prepared a submittal to ERCOT RPG recommending Option #1 as its preferred alternative.

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

**ERCOT Review**

In connection with evaluating Oncor's submittal, ERCOT's independent review initially evaluated four system improvement options to address the observed reliability issues. Table 10 shows the components of the four initial options.

*Note that the numbering of the options reviewed by ERCOT does not correspond to the numbering of the options reviewed by Oncor. Oncor Option #1 largely corresponds to ERCOT Option 2, as explained below.*

---

June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

Transmission Upgrade	Approx. Length of Line (miles)	Normal / Emergency Rating (MVA)	Options			
			1	2*	3	4
Construct a new Ramhorn Hill 345-kV switching station in a 10-breaker breaker-and-a-half arrangement tapped into existing double-circuit Hicks to Willow Creek 345-kV lines				✓	✓	✓
Construct a new Dunham 345-kV switching station in a 10-breaker breaker-and-a-half arrangement tapped into existing Lewisville to Krum West and Lewisville to Roanoke 345-kV lines				✓	✓	✓
Construct two new Ramhorn Hill to Dunham 345-kV transmission lines, with conductor rated to at least 2987 MVA, in a new (estimated 18.4-mile) right-of-way installed on new triple-circuit towers leaving one 138-kV vacant position	18.4	2987/2987		✓	✓	✓
Upgrade Hicks to Exchange 345-kV double-circuit line with conductors rated to at least 2987 MVA	5.8	2987/2987	✓			
Rebuild Exchange to Roanoke 345-kV double-circuit lines, upgrading both with conductors rated to at least 2987 MVA, using separate double-circuit capable structures for each line	3.6	1912/1912**		✓		
Construct a new Exchange to Roanoke 138-kV circuit, with conductor rated to at least 764 MVA, using one of the Exchange to Roanoke 345-kV line double-circuit capable structures	3.8	764/764		✓		
Upgrade Exchange to Roanoke 345-kV double-circuit lines with conductor rating to at least 2987 MVA	3.6	1912/1912**	✓		✓	
Construct a new Exchange 345/138-kV Switching Station, adjacent to Alliance 345-kV substation, with two new 600 MVA transformers (nameplate) in an 8-breaker 345-kV breaker-and-a-half bus arrangement and a 9-breaker 138-kV breaker-and-a-half arrangement		700/750	✓	✓	✓	✓
Convert the existing Alliance 345-kV load serving substation to 138-kV load serving operation			✓	✓	✓	✓
Construct a new Exchange to Alliance 138-kV double-circuit line with conductors rated to at least 746 MVA	0.1	746/746	✓	✓	✓	✓
Construct a new Alliance to Keller Magnolia and Alliance to Heritage 138-kV double-circuit line with conductors rated to at least 746 MVA	1.4 Keller Magnolia 2.5 Heritage	746/746	✓	✓	✓	✓
Upgrade the existing Keller Magnolia to Heritage 138-kV line with conductor rated to at least 746 MVA to be installed on the Alliance to Keller Magnolia and Alliance to Heritage 138-kV double-circuit towers	1.0	746/746	✓	✓	✓	✓
Upgrade the existing Heritage to Keller Magnolia Tap double-circuit lines with conductors rated to at least 746 MVA	1.3	746/746	✓	✓	✓	✓
Construct a new 138-kV switching station at Keller Wall Price in a 6-breaker ring bus arrangement			✓	✓	✓	✓

June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

Disconnect the double-circuit Heritage to Keller Magnolia Tap lines at Keller Magnolia Tap and terminate both at Keller Wall Price by constructing two new 0.3-mile 138-kV transmission lines added to the existing Keller Magnolia Tap to Keller Wall Price right-of-way with both new line conductors rated to at least 746 MVA	0.3	746/746	✓	✓	✓	✓
Retire the Keller Magnolia Tap			✓	✓	✓	✓

**Table 10 – Components of the Four Initial Options Studied by ERCOT**

\*ERCOT's Option 2 is substantially the same as Oncor Option #1.

\*\*Exchange to Roanoke 345-kV conductor will be capable of 2987/2987 MVA, however terminal equipment at Roanoke will limit the line ratings to 1912/1912 MVA.

ERCOT performed reliability assessments on the four initial options based on NERC Reliability Standard TPL-001-4, the applicable ERCOT Nodal Protocols, and Planning Criteria. ERCOT's initial reliability assessment identified thermal overload violations under ERCOT Option 1, resulting in its being eliminated from further evaluation. No reliability criteria violations were identified for ERCOT Options 2, 3, and 4, so ERCOT short-listed these options for further assessment.

To evaluate the operational flexibility of the short-listed options, ERCOT developed an off-peak scenario for planned maintenance outage (N-1-1) analysis. ERCOT first conducted an N-1-1 contingency analysis based on selected single-circuit prior outages, as well as based on selected double-circuit common tower prior outages for each short-listed option. As shown in Table 11 below, the performance was similar for each of the three short-listed options.

	Planned Maintenance Single Circuit Prior Outage		Planned Maintenance Double Circuit Common Tower Prior Outage	
	Thermal Overloads	Voltage Instability	Thermal Overloads	Voltage Instability
Option 2	No	No	No	No
Option 3	No	No	No	No
Option 4	No	No	No	No

**Table 11 – Results of Planned Maintenance N-1-1 Outage Analysis**

To further evaluate the operational flexibility provided by the short-listed options, ERCOT conducted an additional prior outage maintenance scenario based on input from Oncor. As shown in Table 12 below, ERCOT's Option 2 performed better under this scenario as it was the only short-listed option that did not show a Roanoke 345/138 kV transformer overload.

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

	<b>Planned Maintenance TSP Requested Scenario (X-1 + Double-Circuit Line Segment)</b>	
	<b>Thermal Overloads</b>	<b>Voltage Stability</b>
Option 2	No	Ok
Option 3	Yes	Ok
Option 4	Yes	Ok

**Table 12 – Results of TSP Requested Planned Maintenance Outage Analysis**

To estimate and compare the long-term load-serving capabilities of the three short-listed options, ERCOT adjusted load-up in the substations identified in the Roanoke area in Oncor’s submittal to RPG. To balance power, ERCOT adjusted down conforming load outside of the North Central weather zone and simulated N-1 contingencies.

Because ERCOT Option 2 offered better long-term load-serving capability, better operational flexibility during transformer prior outage conditions, and better flexibility for future utilization associated with transmission between Exchange and Roanoke, ERCOT selected Option 2 as its preferred option.

ERCOT’s analysis revealed that six 138 kV and one 345 kV transmission line thermal overloads would need to be addressed for all three of the short-listed options to increase long-term load-serving capability. In addition, Options 3 and 4 would require additional transmission improvements to address overloading on the two existing 345/138 kV transformers at Roanoke to further increase load serving capability. Because Option 2 did not require these additional major transmission improvements, ERCOT selected Option 2 as the most favorable option for increasing long-term load serving capability.

A comparison of the three short listed options is shown in Table 13 below.

	<b>Option 2</b>	<b>Option 3</b>	<b>Option 4</b>
Met ERCOT and NERC Reliability Criteria	Yes	Yes	Yes
Improved Operational Flexibility	Better	Yes	Yes
Long-term Load Serving Performance	Better	Yes	Yes
Capital Cost Estimates	\$286 M	\$264 M	\$254 M

**Table 13 - Comparison of Short-Listed Options**

ERCOT endorsed Option 2, including the Proposed Transmission Line Project, as a Tier 1 transmission project that is critical to the reliability of the ERCOT system pursuant to 16 TAC § 25.101(b)(3)(D).

Distribution alternatives will not resolve the identified reliability issues on the transmission system.

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

Bundling or upgrading conductor, adding transformers, or upgrading voltages alone will not address the identified reliability issues or provide the necessary level of service to meet electric demand in the Roanoke-Alliance area.

**16. Schematic or Diagram:**

**For a standard application, provide a schematic or diagram of the applicant's transmission system in the proximate area of the project. Show the location and voltage of existing transmission lines and substations, and the location of the construction. Locate any taps, ties, meter points, or other facilities involving other utilities on the system schematic.**

A schematic of the transmission system in the proximate area of the Roanoke Area Upgrades Project, including the Proposed Transmission Line Project, is shown in Attachment No. 6. The location and voltage of existing transmission lines, substations, taps, ties, meter points or other facilities involving other utilities in relation to the Proposed Transmission Line Project are included. A map of the project area can be found in Figures 3-1A, 3-1B, 3-1C, and 3-1D of the Environmental Assessment and Alternative Route Analysis in Appendix H included as Attachment No. 1.

**17. Routing Study:**

**Provide a brief summary of the routing study that includes a description of the process of selecting the study area, identifying routing constraints, selecting potential line segments, and the selection of the routes. Provide a copy of the complete routing study conducted by the utility or consultant. State which route the applicant believes best addresses the requirements of PURA and P.U.C. Substantive Rules.**

Oncor retained Halff to prepare the Environmental Assessment and Routing Study. The objective of the Environmental Assessment and Routing Study is to provide information in support of this Application in addressing the requirements of § 37.056(c)(4)(A)-(D) of the Texas Utilities Code, the PUCT's CCN Application form, and 16 Texas Administrative Code ("TAC") § 25.101 as these apply to the Proposed Transmission Line Project.

By examining existing environmental conditions, including the human and natural resources that are located in the project area, the Environmental Assessment and Routing Study appraises the environmental effects that could result from the construction, operation, and maintenance of the Proposed Transmission Line Project. The Environmental Assessment and Routing Study may also be used in support of any additional local, state, or federal permitting activities that may be required for the Proposed Transmission Line Project.

To assist Halff in its evaluation, Oncor provided Halff with information regarding the project endpoints, the need for the project, engineering and design requirements, construction practices, and ROW requirements for the Proposed Transmission Line Project.

---

June 8, 2023



**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

After considering environmental and geographical data, Halff defined a study area that encompassed the provided endpoints with a sufficient area to identify a diverse set of potential routing alternatives. *See* Section 3.0 of the Environmental Assessment and Routing Study, included as Attachment No. 1, for a discussion of the study area. Routing constraints were identified after collection of area data from many sources (*e.g.*, governmental agencies, evaluation of aerial photography) and consideration of the criteria established in § 37.056(c)(4)(A)-(D) of the Texas Utilities Code, the PUCT's CCN Application form, and 16 TAC § 25.101.

Potential line segments were identified by evaluating the constraints mapped within the study area and then developing potential pathways, such as existing corridors and other linear features where constraints were minimal. Corridors were identified and developed into potentially viable routes. Potential impacts to both the human and natural environment were evaluated by Halff for each identified preliminary alternative route.

Oncor then evaluated the alternative routes and selected Route 179 as the route that best addresses the requirements of PURA § 37.056(c)(4)(A)-(D) and 16 TAC § 25.101.

Specific discussions regarding the study area, identification of constraints, selection of potential line segments, and alternative route analysis are set forth in the Environmental Assessment and Routing Study. Specific discussion regarding the evaluation and selection of routes filed with the Application and the route that Oncor believes best complies with the requirements of the Texas Utilities Code and the PUCT's Substantive Rules is contained in an office memorandum from Brenda J. Perkins (included as Attachment No. 7).

**18. Public Meeting or Public Open House:**

**Provide the date and location for each public meeting or public open house that was held in accordance with 16 TAC §22.52. Provide a summary of each public meeting or public open house including the approximate number of attendants, and a copy of any survey provided to attendants and a summary of the responses received. For each public meeting or public open house provide a description of the method of notice, a copy of any notices, and the number of notices that were mailed and/or published.**

Oncor hosted two public participation meetings in accordance with 16 TAC § 22.52. They were attended by personnel from Oncor, Halff, and Integra Realty Resources, a contractor assisting Oncor in property abstracting. The public participation meetings were held on December 7 and December 8, 2022, from 4:00 p.m. to 7:00 p.m., at the Marriott Hotel & Golf Club Champions Circle in Fort Worth, Texas.

Oncor mailed a total of 2,068 individual written notices of the meetings to all owners of property within 500 feet of the centerline of the preliminary alternative route links for the Proposed Transmission Line Project in accordance with 16 TAC §22.52(a)(4). In consideration of horizontal accuracy limitations as it relates to appraisal district data and

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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

aerial photography interpretation when developing preliminary routes, notification to property owners was over-inclusive, including properties crossed by or within 520 feet of preliminary alternative route centerlines. Also, public notices were published on November 26 and November 27, 2022, in the *Denton Record Chronicle* and on November 23, 2022, in the *Wise County Messenger* announcing the location, time, and purpose of the meetings. Oncor provided notice of the public meetings to the Department of Defense Siting Clearinghouse in accordance with 16 TAC § 22.54(a)(4). Oncor also provided courtesy notice of the public meetings to identified pipeline companies within the project area.

The meetings were designed to solicit comments and input from residents, landowners, public officials, and other interested parties concerning the Proposed Transmission Line Project. The objectives of the meetings included promoting an understanding of the Proposed Transmission Line Project, including the purpose, need, and potential benefits and impacts; informing and educating the public with regard to the routing process and schedule; and gathering information about the values and concerns of the public and community leaders.

The meetings were configured in an informal information station format rather than a formal speaker/audience format, with each station assigned to a particular aspect of the project or routing process and staffed with representatives from Oncor and/or Halff. Each station had exhibits, maps, illustrations, aerial photography, or other information describing certain project aspects and subject matter information. Attendees were encouraged at the meeting's outset to visit each station in order, so the entire process could be explained in the general sequence of project development. Oncor has found this meeting format valuable due to its informality and because it allows attendees to gather information most important to them and to spend as much time as necessary with those particular project aspects. Additionally, individual discussions allow for and encourage more interaction from attendees who otherwise might be hesitant to participate in a more formal setting.

At the public participation meeting held on December 7, 2022, 77 people signed in and 27 questionnaires were received. At the public participation meeting held on December 8, 2022, 95 people signed in and 44 questionnaires were received. Numerous questionnaires and/or letters were submitted to Oncor after the public meetings via email.

Additional discussion concerning the public involvement program and specific information regarding the public participation meetings may be found in the Environmental Assessment and Routing Study, Section 2.5, pages 2-11 through 2-12, Section 5.0, pages 5-1 through 5-22, and Figures 3-0 and 5-1, included as Attachment No. 1. A representative copy of the notice that was provided to property owners and a copy of the questionnaire provided to meeting attendees is included in Appendix B of Attachment No. 1.

---

June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

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**19. Routing Maps:**

Base maps should be a full scale (one inch = not more than one mile) highway map of the county or counties involved, or other maps of comparable scale denoting sufficient cultural and natural features to permit location of all routes in the field. Provide a map (or maps) showing the study area, routing constraints, and all routes or line segments that were considered prior to the selection of the routes. Identify the routes and any existing facilities to be interconnected or coordinated with the project. Identify any taps, ties, meter points, or other facilities involving other utilities on the routing map. Show all existing transmission facilities located in the study area. Include the locations of radio transmitters and other electronic installations, airstrips, irrigated pasture or cropland, parks and recreational areas, historical and archeological sites (subject to the instructions in Question 27), and any environmentally sensitive areas (subject to the instructions in Question 29).

Figures 3-1A, 3-1B, 3-1C (one inch = 1,000 feet maps), and Figure 3-1D (one inch = 300 feet map), are included in the Appendix H map pockets of the Environmental Assessment and Routing Study, included as Attachment No. 1. These base maps denote sufficient cultural and natural features to permit location of all routes in the field. These maps delineate the study area, routing constraints, and all routes and route links considered in the selection of routes. These maps also depict the approximate locations of radio transmitters and other electronic installations, airstrips, irrigated pasture or cropland, parks and recreational areas, historical and archeological sites, and environmentally sensitive areas, if any. Figures 3-1A-D depict existing transmission facilities in the area of the Proposed Transmission Line Project, including taps, ties, meter points, or other utility facilities, as applicable.

Provide aerial photographs of the study area displaying the date that the photographs were taken or maps that show (1) the location of each route with each route segment identified, (2) the locations of all major public roads including, as a minimum, all federal and state roadways, (3) the locations of all known habitable structures or groups of habitable structures (see Question 19 below) on properties directly affected by any route, and (4) the boundaries (approximate or estimated according to best available information if required) of all properties directly affected by any route.

Figures 3-1A-D of the Environmental Assessment and Routing Study, included as Attachment No. 1, depict on an aerial photograph: (1) the location of each link that is used in the alternative routes filed in this CCN, with each link identified; (2) the locations of all major public roads, including all federal and state roadways; (3) the locations of all known habitable structures on properties directly affected by any link used in the alternative routes; and (4) the boundaries (approximate or estimated according to available county tax information) of all properties directly affected by any link used in an alternative route. In addition, the locations of radio transmitters and other electronic installations, airstrips, irrigated pasture or cropland, parks and recreational areas, historical and archeological sites, and environmentally sensitive areas, if any, are depicted.

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

**For each route, cross-reference each habitable structure (or group of habitable structures) and directly affected property identified on the maps or photographs with a list of corresponding landowner names and addresses and indicate which route segment affects each structure/group or property.**

Attachment No. 8 is a table that cross-references each habitable structure and directly affected property identified in Figures 3-1A-D of Attachment No. 1; the cross-reference table includes corresponding landowner names and addresses and indicates which links and alternative routes affect each structure or property.

**20. Permits:**

**List any and all permits and/or approvals required by other governmental agencies for the construction of the proposed project. Indicate whether each permit has been obtained.**

The following permits/approvals will be obtained after PUC approval of the CCN and prior to beginning construction, if necessary:

1. Texas Department of Transportation ("TxDOT") permit(s) for crossing a state-maintained roadway.
2. A Storm Water Pollution Prevention Plan ("SWPPP") will be prepared and a Notice of Intent will be submitted to the Texas Commission on Environmental Quality under the Texas Pollutant Discharge Elimination System ("TPDES") program.
3. A cultural resources survey plan will be developed with the Texas Historical Commission ("THC") for the proposed project.
4. Consultation with the U.S. Army Corps of Engineers will occur following the Commission's approval of this Application to determine appropriate requirements under Section 404/Section 10 Permit criteria.
5. Consultation with the U.S. Fish and Wildlife Service will occur following the Commission's approval of this Application to determine appropriate requirements under the Endangered Species Act.
6. Consultation with the Federal Aviation Administration ("FAA") will occur following the Commission's approval of this Application to determine appropriate requirements and notification under Federal Aviation Regulations (14 CFR Part 77).

**21. Habitable structures:**

**For each route list all single-family and multi-family dwellings and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, business structures, churches, hospitals, nursing homes, schools, or other structures normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis within 300 feet of the centerline if the proposed project will be constructed for operation at 230kV or less, or within 500 feet of the centerline if the proposed project will be constructed for operation at greater than 230kV. Provide a general description of each habitable structure and its distance from the centerline of the route. In cities, towns or rural subdivisions, houses can be identified in groups. Provide the number of habitable structures in each group and list the distance from the centerline of the route to the closest**

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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

**and the farthest habitable structure in the group. Locate all listed habitable structures or groups of structures on the routing map.**

A listing of all habitable structures located within 500 feet of each proposed link centerline used in the alternative routes filed in this CCN, along with a general description of each habitable structure and its distance from the centerline of the link and the associated alternative routes, is provided in the table in Attachment No. 9.

Figures 3-1A-D (Appendix H map pockets), located in Attachment No. 1, depict the locations of all known habitable structures directly affected by the links used in the proposed alternative routes.

**22. Electronic Installations:**

**For each route, list all commercial AM radio transmitters located within 10,000 feet of the center line of the route, and all FM radio transmitters, microwave relay stations, or other similar electronic installations located within 2,000 of the center line of the route. Provide a general description of each installation and its distance from the center line of the route. Locate all listed installations on a routing map.**

There are no known AM radio transmitters located within 10,000 feet of the centerline of any of the alternative route links and no known FM radio transmitters located within 2,000 feet of the centerline of any of the alternative route links.

There are twelve other communication towers located within 2,000 feet of the centerline of the filed alternative routes. A listing of these communication towers located within 2,000 feet of each proposed link centerline used in the alternative routes filed in this CCN, along with a general description of each tower and its distance from the centerline of the link and the associated alternative routes is provided in the table in Attachment No. 10.

Please refer to Section 3.7.7, page 3-77, and Section 7.7.6, page 7-24, of the Environmental Assessment and Routing Study included as Attachment No. 1.

**23. Airstrips:**

**For each route, list all known private airstrips within 10,000 feet of the center line of the project. List all airports registered with the Federal Aviation Administration (FAA) with at least one runway more than 3,200 feet in length that are located within 20,000 feet of the center line of any route. For each such airport, indicate whether any transmission structures will exceed a 100:1 horizontal slope (one foot in height for each 100 feet in distance) from the closest point of the closest runway. List all listed airports registered with the FAA having no runway more than 3,200 feet in length that are located within 10,000 feet of the center line of any route. For each such airport, indicate whether any transmission structures will exceed a 50:1 horizontal slope from the closest point of the closest runway. List all heliports located within 5,000 feet of the center line of any route.**

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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

**For each such heliport, indicate whether any transmission structures will exceed a 25:1 horizontal slope from the closest point of the closest landing and takeoff area of the heliport. Provide a general description of each listed private airstrip, registered airport, and heliport; and state the distance of each from the center line of each route. Locate and identify all listed airstrips, airports, and heliports on a routing map.**

Halff's review of federal and state aviation/airport maps and directories, aerial photo interpretation, and reconnaissance surveys identified: no private airstrips within 10,000 feet of the centerline of the proposed routes; four FAA-registered airports with a runway greater than 3,200 feet in length within 20,000 feet of the proposed routes; six FAA-registered airports without a runway greater than 3,200 feet in length within 10,000 feet of the proposed routes; and three heliports within 5,000 feet of the proposed routes.

A listing of the airstrips, airports and heliports located near the filed alternative routes, along with a general description of each facility and its distance from the centerline of the link and the associated alternative routes is provided in the table in Attachment No. 11.

Please refer to Section 3.7.6, pages 3-74 through 3-77, and Section 7.7.5, pages 7-21 through 7-24, of the Environmental Assessment included as Attachment No. 1.

**24. Irrigation Systems:**

**For each route identify any pasture or cropland irrigated by traveling irrigation systems (rolling or pivot type) that will be traversed by the route. Provide a description of the irrigated land and state how it will be affected by each route (number and type of structures etc.). Locate any such irrigated pasture or cropland on a routing map.**

Results of aerial photography interpretation and field reconnaissance surveys did not identify any pasture or cropland irrigated by traveling irrigation systems (rolling or pivot type) that will be traversed by any of the alternative routes of the Proposed Transmission Line Project.

Please refer to Tables 7-2 and 7-3 in Appendix E of the Environmental Assessment and Routing Study included as Attachment No. 1.

**25. Notice:**

**Notice is to be provided in accordance with 16 TAC §22.52.**

**A. Provide a copy of the written direct notice to owners of directly affected land. Attach a list of the names and addresses of the owners of directly affected land receiving notice.**

A copy of the written direct notice, with attached map, that will be provided to the owners of the directly-affected land is included as Attachment No. 12. The

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

names and addresses of the owners of the directly-affected land, to whom notice will be mailed by first-class mail, are included as Attachment No. 8.

- B. Provide a copy of the written notice to utilities that are located within five miles of the routes.**

A copy of the written direct notice, with attached map, that will be provided to utilities that are located within five miles of the routes is included as Attachment No. 13.

- C. Provide a copy of the written notice to county and municipal authorities, and the Department of Defense Siting Clearinghouse. Notice to the DoD Siting Clearinghouse should be provided at the email address found at <http://www.acq.osd.mil/dodsc/>.**

A representative copy of the written notice, with attached map, that will be provided to county authorities is included as Attachment No. 13. The following county authorities will be provided the requisite notice on or before the filing date as required by Commission rules:

Denton County, County Judge  
Denton County, County Commissioners – Precincts 1, 2, 3, and 4  
Denton County, County Administrator  
Denton County, Historical Commission  
Wise County, County Judge  
Wise County, County Commissioners – Precincts 1, 2, 3, and 4  
Wise County, Historical Commission

A representative copy of the written notice, with attached map, that will be provided to municipal authorities is included as Attachment No. 13. The following municipal authorities will be provided the requisite notice on or before the filing date, as required by Commission rules:

- Town of Argyle: Mayor, Town Administrator, Assistant Town Secretary, Council Members, Community Development Director
- City of Aurora: Mayor, Mayor Pro Tem, Interim City Administrator, City Secretary, Council Members
- Town of Bartonville: Mayor, Mayor Pro Tem, Town Administrator, Town Secretary, Council Members
- Town of Corral City (formerly known as Draper): Mayor, Mayor Pro Tem, Aldermen
- City of Denton: Mayor, Mayor Pro Tem, City Manager, City Secretary, Economic Development Director, Council Members
- Town of DISH: Mayor, Commissioners

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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

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- Town of Double Oak: Mayor, Mayor Pro Tem, Deputy Mayor Pro Tem, Town Secretary, Council Members
- Town of Flower Mound: Mayor, Mayor Pro Tem, Deputy Mayor Pro Tem, Town Manager, Town Secretary, Economic Development Director, Council Members
- City of Fort Worth: Mayor, City Manager, Assistant City Managers, City Secretary, Development Services Director, Council Members
- City of Haslet: Mayor, Mayor Pro Tem, City Secretary, Council Members
- City of Justin: Mayor, Mayor Pro Tem, Interim City Manager, Assistant City Manager, City Secretary, Council Members
- City of Keller: Mayor, Mayor Pro Tem, City Manager, City Secretary, Economic Development Manager, Council Members
- City of New Fairview: Mayor, Mayor Pro Tem, City Administrator, City Operations Administrator, City Secretary, Council Members
- City of Newark: Mayor, Mayor Pro Tem, City Secretary, Council Members
- Town of Northlake: Mayor, Town Manager, Town Secretary, Council Members
- City of Rhome: Mayor, Mayor Pro Tem, City Administrator, City Secretary, Council Members
- City of Roanoke: Mayor, Mayor Pro Tem, City Manager, City Secretary, Council Members
- City of Southlake: Mayor, Mayor Pro Tem, Deputy Mayor Pro Tem, City Manager, Assistant City Manager, City Secretary, Council Members
- Town of Trophy Club: Mayor, Interim Town Manager, Town Secretary, Community Director, Council Members
- Town of Westlake: Mayor, Mayor Pro Tem, Town Manager, Town Secretary, Council Members

A representative copy of the written notice, with attached map, that will be provided to the Department of Defense Siting Clearinghouse by email at: [osd.dod-siting-clearinghouse@mail.mil](mailto:osd.dod-siting-clearinghouse@mail.mil), and by first-class mail to the address below on the date this Application is filed, is included as Attachment No. 13.

DOD Siting Clearinghouse  
3400 Defense Pentagon, Room 5C646  
Washington, DC 20301-3400

- D. Provide a copy of the notice that is to be published in newspapers of general circulation in the counties in which the facilities are to be constructed. Attach a list of the newspapers that will publish the notice for this application. After the notice is published, provide the publisher's affidavits and tear sheets.**
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June 8, 2023



**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

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Notice of this Application will be published in the *Denton Record Chronicle*, a newspaper of general circulation in Denton County, and in the *Wise County Messenger*, a newspaper of general circulation in Wise County. A representative copy of the general public notice to be published is included as Attachment No. 14.

Proof of publication will be provided in the form of a publisher's affidavit and tear sheet following publication of this notice.

**For a CREZ application, in addition to the requirements of 16 TAC § 22.52 the applicant shall, not less than twenty-one (21) days before the filing of the application, submit to the Commission staff a "generic" copy of each type of alternative published and written notice for review. Staff's comments, if any, regarding the alternative notices will be provided to the applicant not later than seven days after receipt by Staff of the alternative notices. Applicant may take into consideration any comments made by Commission staff before the notices are published or sent by mail.**

Not applicable.

A copy of the application and all attachments will also be provided to the Texas Office of Public Utility Counsel ("OPUC"). A representative copy of the written notice, with attached map, that will be provided to OPUC is included as Attachment No. 13.

**26. Parks and Recreation Areas:**

**For each route, list all parks and recreational areas owned by a governmental body or an organized group, club, or church and located within 1,000 feet of the center line of the route. Provide a general description of each area and its distance from the center line. Identify the owner of the park or recreational area (public agency, church, club, etc.). List the sources used to identify the parks and recreational areas. Locate the listed sites on a routing map.**

A review of federal, state, and local websites and maps, as well as field reconnaissance surveys, identified several parks and recreational areas owned by a government body or an organized group, club, or church within 1,000 feet of the centerline of the alternative routes. The table in Attachment No. 16 provides a general description of each area, its distance from the proposed route centerlines and the park or recreational area's ownership.

Please refer to Section 3.7.2, pages 3-66 through 3-68, and Section 7.7.2, pages 7-17 through 7-19, of the Environmental Assessment and Routing Study, included as Attachment No. 1.

**27. Historical and Archeological Sites:**

**For each route, list all historical and archeological sites known to be within 1,000 feet of the center line of the route. Include a description of each site and its distance from the center line. List the sources (national, state or local commission or societies) used to identify the**

June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

---

sites. Locate all historical sites on a routing map. For the protection of the sites, archeological sites need not be shown on maps.

Research and a records review were conducted of the Texas Historical Commission ("THC") Historic Sites Atlas and the THC Archaeological Sites Atlas, to locate known cultural resources within 1,000 feet of the centerline of any route for the Proposed Transmission Line Project. THC records indicated two Historic Texas Cemeteries and one historical marker are within 1,000 feet of the alternative route centerlines. Two archeological sites were identified within 1,000 feet of the alternative route centerlines. The distances from these cultural resources to the closest route links and the corresponding routes are provided in the table in Attachment No. 17.

Please refer to Section 3.8, pages 3-77 through 3-92, and Section 7.8, pages 7-24 through 7-29, of the Environmental Assessment and Routing Study, included as Attachment No. 1.

**28. Coastal Management Program:**

For each route, indicate whether the route is located, either in whole or in part, within the coastal management program boundary as defined in 31 T.A.C. §503.1. If any route is, either in whole or in part, within the coastal management program boundary, indicate whether any part of the route is seaward of the Coastal Facilities Designation Line as defined in 31 T.A.C. §19.2(a)(21). Using the designations in 31 T.A.C. §501.3(b), identify the type(s) of Coastal Natural Resource Area(s) impacted by any part of the route and/or facilities.

The Proposed Transmission Line Project is not located, either in whole or in part, within the coastal management program boundary as defined in 31 TAC §503.1.

**29. Environmental Impact:**

Provide copies of any and all environmental impact studies and/or assessments of the project. If no formal study was conducted for this project, explain how the routing and construction of this project will impact the environment. List the sources used to identify the existence or absence of sensitive environmental areas. Locate any environmentally sensitive areas on a routing map. In some instances, the location of the environmentally sensitive areas or the location of protected or endangered species should not be included on maps to ensure preservation of the areas or species.

The Environmental Assessment and Routing Study prepared by Halff is included as Attachment No. 1.

Within seven days after filing the application for the project, provide a copy of each environmental impact study and/or assessment to the Texas Parks and Wildlife Department (TPWD) for its review at the address below. Include with this application a copy of the letter of transmittal with which the studies/assessments were or will be sent to the TPWD.

**Wildlife Habitat Assessment Program  
Wildlife Division**

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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

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**Texas Parks and Wildlife Department  
4200 Smith School Road  
Austin, Texas 78744**

**The applicant shall file an affidavit confirming that the letter of transmittal and studies/assessments were sent to TPWD.**

A copy of the Environmental Assessment and Application will be provided to the Texas Parks and Wildlife Department for review within seven days following the filing of the Application for the Proposed Transmission Line Project. Please refer to Attachment No. 18 for a copy of the transmittal letter with which the Environmental Assessment and Application will be sent to the TPWD.

**30. Affidavit**

*Attach a sworn affidavit from a qualified individual authorized by the applicant to verify and affirm that, to the best of their knowledge, all information provided, statements made, and matters set forth in this application and attachments are true and correct.*

**31. List of Attachments to the CCN Application**

- Attachment No. 1: Environmental Assessment
- Attachment No. 2: Layout of the Proposed Ramhorn Hill Switch and Layout of the Proposed Dunham Switch
- Attachment No. 3: Cost Estimates
- Attachment No. 4: ERCOT's Independent Review of Oncor Roanoke Area Upgrades Project dated July 19, 2022
- Attachment No. 5: Transmission Area Map showing ERCOT's Recommended Roanoke Area Upgrades
- Attachment No. 6: Schematic of Transmission System in Proximate Area of Project
- Attachment No. 7: Routing Memorandum of Brenda J. Perkins
- Attachment No. 8: Listing of Directly Affected Land Owners for Notice
- Attachment No. 9: Habitable Structures within 500 Feet of the Filed Alternative Routes
- Attachment No. 10: Electronic Installations within 2,000 Feet of the Filed Alternative Routes
- Attachment No. 11: Aircraft Landing Facilities Near the Filed Alternative Routes
- Attachment No. 12: Copy of Notice to Directly Affected Land Owners
- Attachment No. 13: Copy of Notice to Utilities, Counties, Municipalities, OPUC, and Department of Defense Siting Clearinghouse

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June 8, 2023

**Standard Application for a Certificate of Convenience and Necessity for a  
Proposed Transmission Line  
and  
Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Pursuant To  
16 TAC §25.174**

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- Attachment No. 14: Copy of Newspaper/Public Notice
- Attachment No. 15: Copy of Courtesy Notice to Pipeline Owners/Operators
- Attachment No. 16: Park and Recreational Areas within 1,000 Feet of the Filed Alternative Routes
- Attachment No. 17: Cultural Resources within 1,000 Feet of the Filed Alternative Routes
- Attachment No. 18: Transmittal Letter to TPWD
- Attachment No. 19: Affidavit

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June 8, 2023

The following files are not convertible:

Att. 3 Cost Estimates.xlsx

Please see the ZIP file for this Filing on the PUC Interchange in order to access these files.

Contact [centralrecords@puc.texas.gov](mailto:centralrecords@puc.texas.gov) if you have any questions.

# Office Memorandum



**Date:** May 30, 2023

**To:** File

**From:** Brenda J. Perkins

**Subject:** Alternative Routes Evaluation: Ramhorn Hill-Dunham 345 kV Transmission Line Project

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This memorandum discusses my evaluation of routing alternatives for Oncor Electric Delivery Company LLC's ("Oncor's") proposed Ramhorn Hill-Dunham 345 kV Transmission Line Project ("Proposed Transmission Line Project"). In addition to the recommendation for a route that best meets the requirements of the Texas Utilities Code and the Substantive Rules of the Public Utility Commission of Texas ("Commission"), I also selected alternative routes to be filed with this CCN Application.

The goal of this process is to provide the Commission with an adequate number of alternative routes to conduct a proper evaluation. These alternative routes provide good geographic diversity while complying with Section 37.056(c)(4)(A)-(D) of the Texas Utilities Code, Commission Procedural Rule 22.52(a)(4), and Commission Substantive Rule 25.101(b)(3)(B), including the Commission's policy of prudent avoidance.

My recommendations are based on my reconnaissance and observations of the project area, my independent review of the data included in the *Environmental Assessment and Alternative Route Analysis for Oncor Electric Delivery Company LLC's Proposed Ramhorn Hill Switch-Dunham Switch 345 kV Transmission Line Project in Denton and Wise Counties, Texas* ("Environmental Assessment and Routing Study"), prepared by Halff Associates, Inc. ("Halff"), my discussions with Halff personnel, my discussions with Oncor personnel, my participation in the public participation meeting process, my review of correspondence related to the Proposed Transmission Line Project, my understanding of other input that Oncor received from interested parties, and other information. My recommendation incorporates consideration of engineering feasibility, the estimated cost of alternative routes, construction limitations, and other information.

Halff documented its efforts to identify potential preliminary alternative routes for the Proposed Transmission Line Project in Section 4.0 of the Environmental Assessment and Routing Study. After Halff completed the initial data gathering and constraints mapping process, they identified preliminary alternative route links on recent aerial photography obtained from NearMap (available through Halff's subscription service). These preliminary alternative route links were selected considering the location of existing corridors, apparent property boundaries and routing constraints. Some of the routing constraints within the study area are: United States Army Corp of Engineers ("USACE") owned recreational and environmentally sensitive land; many major highways where 90-degree roadway crossings by transmission lines are required by the Texas Department of Transportation; oil and gas facilities; existing and developing residential and commercial areas; aircraft landing facilities; as well as other constraints. Numerous preliminary

alternative route links were identified by Halff, prior to the public participation meetings, that when combined, formed many preliminary alternative routes to connect the proposed Ramhorn Hill Switch to the proposed Dunham Switch. The preliminary alternative route links evaluated by Halff and presented at the public participation meetings are depicted in Figures 6-1 through 6-8 located in Appendix C of the Environmental Assessment and Routing Study, along with the alternative route link deletions, additions and modifications that were made following the public participation meetings. The modified preliminary alternative route links are discussed in detail in Section 6.0 of the Environmental Assessment and Routing Study and are briefly summarized below.

In general, links were modified where possible to address public comments and routing constraints identified after additional field investigations. Following the preliminary alternative route link revisions, a total of 140 alternative route links were adopted. Halff identified several hundred thousand alternative routes using these route links. Through an iterative process that considered route length, constraints data, input from public meetings, and information from local, state, and federal officials, Halff and Oncor reduced the total number of route combinations to a smaller subset of geographically diverse and forward progressing alternative routes that were further evaluated, as discussed in Section 7.0 of the Environmental Assessment and Routing Study. A total of 221 alternative routes were selected for further analysis as provided in Table 7-2 in Appendix E of the Environmental Assessment and Routing Study.

Each of the 221 preliminary alternative routes identified possesses both positive and negative comparative attributes. I considered these attributes to select a set of geographically diverse routing alternatives to be filed as a part of this Application. Each alternative route complies with Section 37.056(c)(4)(A)-(D) of the Texas Utilities Code and the Commission's Substantive Rule 25.101, including the Commission's policy of prudent avoidance.

Below, I discuss the alternative routes that I selected to be filed with the Application. The alternative routes can be grouped in many different ways; one approach is the grouping of alternative routes into geographic corridors. I grouped the alternative routes into six different geographic corridors using State Highway ("SH") 114 as the division between north and south corridor designation. These six corridors are identified as the: (1) north corridor using Link M8; (2) north corridor using Link M7; (3) north corridor using Link M6; (4) south corridor using Link M5; (5) south corridor using Link M4; and (6) south corridor using Link M3 (*see* map attached to this Memorandum for these alternative route link locations). All alternative routes cross several major highways due to the location of this project's endpoints being on opposite sides of these highways: United States Highway ("US") 377, Interstate Highway ("IH") 35W, Farm to Market ("FM") 156, SH 114, and US 287/81.

I selected 74 geographically diverse alternative routes to be filed with the CCN Application to allow for an adequate number of alternative routes to conduct a proper evaluation. The links that comprise these alternative routes are presented in Table 1, attached to this Memorandum. Table 2, attached to this Memorandum, presents quantifiable environmental data on the 74 alternative routes filed as a part of the CCN Application. The filed alternative routes use each of the 140 alternative links in at least one route.

I then presented these 74 alternative routes to Oncor's engineer overseeing this project, Ms. Amy Zapletal, for consideration of engineering feasibility, construction limitations, and alternative route cost estimates. Below is a discussion of each of the six geographic corridors and the alternative routes selected for filing within each corridor.

The north corridor routes containing Link M8 ("Link M8 Corridor Routes") vary in length from approximately 20.8 to 22.5 miles. Transmission line costs for Link M8 Corridor Routes range from \$166,165,000 to \$178,245,000. Link M8 Corridor Routes contain the greatest number of habitable structures within 500 feet of the route centerline with numbers varying from 188 to 400. The 11 alternatives filed in the Application from the Link M8 Corridor Routes include Alternative Routes 1, 65, 67, 68, 69, 72, 96, 142, 143, 191 and 192.

The north corridor routes containing Link M7 ("Link M7 Corridor Routes") vary in length from approximately 20.5 to 22.5 miles. Transmission line costs for Link M7 Corridor Routes range from \$167,945,000 to \$188,738,000. Link M7 Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 108 to 327. The 17 alternatives filed in the Application from the Link M7 Corridor Routes include Alternative Routes 41, 42, 54, 71, 86, 94, 103, 138, 175, 176, 184, 185, 207, 217, 218, 219 and 221.

The north corridor routes using Link M6 ("Link M6 Corridor Routes") include the longest filed route (Route 216) with routes within this corridor varying in length from approximately 20.4 to 22.9 miles. Transmission line costs for Link M6 Corridor Routes range from \$171,340,000 to \$237,423,000. Link M6 Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 145 to 364. The 12 alternatives filed in the Application from the Link M6 Corridor Routes include Alternative Routes 10, 11, 19, 33, 92, 117, 154, 170, 178, 186, 187 and 216.

The south corridor routes containing Link M5 ("Link M5 Corridor Routes") contain the shortest filed route (Route 16) with route lengths varying from approximately 19.9 to 22.5 miles. Transmission line costs for Link M5 Corridor Routes range from \$172,350,000 to \$208,670,000. Link M5 Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 132 to 271. The 9 alternatives filed in the Application from the Link M5 Corridor Routes include Alternative Routes 5, 16, 25, 26, 28, 61, 108, 146, and 200.

The south corridor routes using Link M4 ("Link M4 Corridor Routes") vary in length from approximately 20.0 to 22.2 miles. Transmission line costs for Link M4 Corridor Routes range from \$172,226,000 to \$212,686,000. Link M4 Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 151 to 266. The 10 alternatives filed in the Application from the Link M4 Corridor Routes include Alternative Routes 3, 15, 24, 36, 44, 58, 63, 70, 78 and 137.

The south corridor routes using Link M3 ("Link M3 Corridor Routes") vary in length from approximately 20.6 to 22.5 miles. Transmission line costs for Link M3 Corridor Routes range from \$164,581,000 to \$224,991,000. Link M3 Corridor Routes contain the least number of habitable structures within 500 feet of the route centerline with numbers varying from 93 to 205. The 15 alternatives filed in the Application from the Link M3 Corridor Routes include Alternative Routes 13, 14, 18, 22, 23, 29, 43, 87, 116, 119, 130, 132, 164, 179 and 199.



After analyzing each of the 74 routes within the six geographic corridors, I selected Route 179 of the Link M3 Corridor Routes as the route that best meets the requirements of Texas Utilities Code Section 37.056 (c)(4)(A)-(D) and the Commission Substantive Rule 25.101(b)(3)(B). Route 179 is comprised of Links A0-A4-B1-B61-B62-C1-C21-C23-C7-E2-E1-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-L3-L2-M1-M2-M3-R4-V2-Z.

Some of the significant factors which led to the selection of Route 179 include the following:

- The length of Route 179 is approximately 21.8 miles, which is only 1.9 miles longer than the shortest among all the filed routes (Route 16) and approximately 1.1 miles shorter than the longest alternative route included in the Application (Route 216 is the longest at approximately 22.9 miles);
- The transmission line estimated cost for Route 179 is \$175,208,000, which is approximately 6.5% more than the least expensive alternative route (Route 29 estimated at \$164,581,000) and is approximately 35.5% less than the most expensive alternative route (Route 117 estimated at \$237,423,000);
- There are 97 habitable structures within 500 feet of the centerline of Route 179, which is only four more than the route with the least number (95 for Route 164) and 303 less than the route with the highest number (400 for Route 192);
- Route 179 parallels existing compatible corridors for 23% of its length (including apparent property boundaries). Route 117 possesses the highest percentage parallel to existing corridors (40%), but is longer in route length (22.7 miles) and has a higher number of habitable structures within 500 feet its centerline (263). Route 221 had the lowest percentage (17%) parallel to existing corridors;
- Route 179 has 4,607 feet of its route through commercial/industrial areas. Route lengths through commercial/industrial areas varied from 4,085 feet (Route 219) to 14,702 feet (Route 117);
- Route 179 crosses 20,248 feet of cropland/hay meadow and crosses 71,051 feet of rangeland pasture. Route lengths crossing cropland/hay meadow varied from 12,347 feet (Route 164) to 36,231 feet (Route 69). Route lengths crossing rangeland pasture varied from 46,458 feet (Route 26) to 76,318 feet (Route 187);
- Route 179 crosses 10,126 feet of upland woodlands and has 7,162 feet of its route through riparian areas. Route 26 has the greatest length (15,960 feet) of its route across upland woodlands and Route 28 has the greatest length (15,718 feet) of its route across riparian areas. The Link M5 Corridor Routes contain the greatest length across upland woodlands and riparian areas which are associated with the floodplain of Elizabeth Creek;
- Route 179 has no length of its route across potential wetlands (57 of the filed routes cross potential wetlands, with Routes 92 and 218 having the highest crossing length of 849 feet);
- Route 179 has 27 streams crossed by its centerline (the greatest number of streams crossed within the filed routes is 33);
- The length of Route 179 that is parallel to streams (within 100 feet) is 1,351 feet (the greatest amount of route length parallel to streams within the filed routes is 5,108 feet);

- Route 179 has 1,704 feet of its route across lakes or ponds (open waters). Route 185 has the greatest length (2,080 feet) across lakes or ponds of the filed routes;
- Route 179 has one known rare/unique plant location within the route right-of-way. Nine of the filed routes have four known rare/unique plant locations within the route right-of-way;
- Route 179 has one recorded cultural resource site crossed by its centerline (34 of the filed routes have one recorded cultural resource site crossed by their centerline);
- Route 179 has three recorded cultural resource sites within 1,000 feet of its centerline (all filed routes have at least one recorded cultural resource site within 1,000 feet of their centerline and two of the filed routes have five recorded cultural resource sites within 1,000 feet of their centerline);
- Route 179 has three FAA-registered airports with a runway greater than 3,200 feet within 20,000 feet of the centerline along its entire length (all filed routes have at least three FAA-registered airports with a runway greater than 3,200 feet within 20,00 feet of their centerline, with some filed routes having four);
- Route 179 has four FAA-registered airports with no runway greater than 3,200 feet within 10,000 feet of the centerline along its entire length (three of the filed routes have six FAA-registered airports with no runway greater than 3,200 feet within 10,000 feet of their centerline);
- Route 179 has two heliports located within 5,000 feet of its centerline (the range of heliports within 5,000 feet of the filed route centerlines is one to three);
- Route 179 has two electronic installations within 2,000 feet of its centerline (the range in electronic installations within 2,000 feet of the filed route centerlines is 0 to 6);
- Route 179 crosses nineteen U.S. or State Highways along its entire length (the greatest number of U.S. or State Highways crossings is twenty);
- Route 179 crosses eleven FM, county roads or other streets along its entire length (the greatest number of FM, county roads or other street crossings is fourteen); and
- Route 179 has been judged to be feasible from an engineering perspective based on currently known conditions, without the benefit of on-the-ground and subsurface surveys, and there are no currently identifiable engineering constraints that impact this alternative route that cannot be addressed with additional consideration by Oncor during the engineering and construction process.

Additional information concerning the issues addressed in this memorandum can be found in the Environmental Assessment and Routing Study, included as Attachment No. 1 to the CCN Application.

After considering all of the parameters and issues as discussed in this memo, I selected Route 179 as the alternative route that best meets the requirements of the Texas Utilities Code and the Commission's Substantive Rules.

The following files are not convertible:

1.xlsx	Att. 7 part 3 of 4 Routing Memo Table
2.xlsx	Att. 7 part 4 of 4 Routing Memo Table
Land Owners for Notice.xlsx	Att. 8 Listing of Directly Affected

Please see the ZIP file for this Filing on the PUC Interchange in order to access these files.

Contact [centralrecords@puc.texas.gov](mailto:centralrecords@puc.texas.gov) if you have any questions.

# HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
	1	315	NNE	Commercial	A1	All Filed Routes
		376	E	Commercial	A0	
		405	ENE	Commercial	A4	
	2	430	NNE	Industrial	A1	22, 23 24, 25, 26, 54, 58, 63
	3	357	N	SFR†	A6	22, 23 24, 25, 26, 54, 58, 63
		379	NNE	SFR	A3	
		490	NE	SFR	A1	
	4	285	E	Commercial	A4	1, 3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 28, 29, 33, 36, 41, 42, 43, 44, 61, 65, 67, 68, 69, 70, 71, 72, 78, 86, 87, 92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146, 154, 164, 170, 175, 176, 178, 179, 184, 185, 186, 187, 191, 192, 199, 200, 207, 216, 217, 218, 219, 221
	5	407	W	SFR	A6	22, 23 24, 25, 26, 54, 58, 63
	6	146	W	SFR	A6	22, 23 24, 25, 26, 54, 58, 63
	7	407	E	Commercial	A6	22, 23 24, 25, 26, 54, 58, 63
	8	409	E	Commercial	A6	22, 23 24, 25, 26, 54, 58, 63
	9	65	E	SFR	B1	1, 3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 28, 29, 33, 36, 41, 42, 43, 44, 61, 65, 67, 68, 69, 70, 71, 72, 78, 86, 87, 92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146, 154, 164, 170, 175, 176, 178, 179, 184, 185, 186, 187, 191, 192, 217, 218, 219
	10	137	E	SFR	B1	1, 3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 28, 29, 33, 36, 41, 42, 43, 44, 61, 65, 67, 68, 69, 70, 71, 72, 78, 86, 87, 92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146, 154, 164, 170, 175, 176, 178, 179, 184, 185, 186, 187, 191, 192, 217, 218, 219
	11	253	WSW	SFR	B4	22, 23 24, 25, 26, 54, 58, 63, 199, 200, 207, 216, 221
	12	277	ENE	SFR	B4	22, 23 24, 25, 26, 54, 58, 63, 199, 200, 207, 216, 221
	13	156	E	Commercial	B4	22, 23 24, 25, 26, 54, 58, 63, 199, 200, 207, 216, 221
	14	429	E	Commercial	B4	22, 23 24, 25, 26, 54, 58, 63, 199, 200, 207, 216, 221
1 (40 HS)	15	413	NNE	SFR	C3	1, 3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 22, 23, 24, 25, 26, 28, 29, 33, 36, 41, 42, 43, 44, 54, 58, 61, 63, 65, 67, 68, 69, 70, 71, 72, 78, 86, 87, 199, 200, 207, 216, 221
	16	402	NNE	SFR	C3	
	17	401	NNE	SFR	C3	
	18	398	NNE	SFR	C3	
	19	396	NNE	SFR	C3	
	20	388	NNE	SFR	C3	
	21	383	NNE	SFR	C3	
	22	352	NNE	SFR	C3	
	23	510	NNE	SFR	C3	
	24	450	NNE	SFR	C3	
	25	408	NNE	SFR	C3	
	26	344	NNE	SFR	C3	
	27	367	NNE	SFR	C3	
	28	378	NNE	SFR	C3	
	29	460	NNE	SFR	C3	

Shaded values represent the shortest and longest distance between a habitable structure and a link within a group route subset

\* Direction represents the distance beginning from the habitable structure towards the provided link.

† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.

## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
(HS Group 1 cont.)	30	482	NNE	SFR	C3	1, 3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 22, 23, 24, 25, 26, 28, 29, 33, 36, 41, 42, 43, 44, 54, 58, 61, 63, 65, 67, 68, 69, 70, 72, 78, 86, 87, 199, 200, 207
	31	449	NNE	SFR	C3	
	32	423	NNE	SFR	C3	
	33	410	NNE	SFR	C3	
	34	403	NNE	SFR	C3	
	35	414	NNE	SFR	C3	
	36	430	NNE	SFR	C3	
	37	448	NNE	SFR	C3	
	38	461	NNE	SFR	C3	
	39	483	NNE	SFR	C3	
	40	461	NNE	SFR	C3	
	41	437	NNE	SFR	C3	
	42	392	NNE	SFR	C3	
	43	477	NW	SFR	C6	
		517	NNE	SFR	C3	
	44	445	NW	SFR	C6	1, 3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 22, 23, 24, 25, 26, 28, 29, 33, 36, 41, 42, 43, 44, 54, 58, 61, 63, 65, 67, 68, 69, 70, 71, 72, 78, 86, 87, 199, 200, 207, 216, 221
	45	424	NW	SFR	C6	
	46	413	NNW	SFR	C6	
	47	394	NNW	SFR	C6	
	48	362	NNW	SFR	C6	
	49	368	WNW	SFR	C6	
		369	NNE	SFR	C3	
		508	NNW	SFR	C4	
	50	321	WNW	SFR	C6	
		385	NNE	SFR	C3	
		489	NNW	SFR	C4	
	51	276	WNW	SFR	C6	
		393	NNE	SFR	C3	
		472	NNW	SFR	C4	
	52	217	WNW	SFR	C6	1, 3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 22, 23, 24, 25, 26, 28, 29, 33, 36, 41, 42, 43, 44, 54, 58, 61, 63, 65, 67, 68, 69, 70, 71, 72, 78, 86, 87, 199, 200, 207, 216, 221
		393	NNE	SFR	C3	
		445	N	SFR	C4	
	53	183	NW	SFR	C6	
		415	NNE	SFR	C3	
		448	N	SFR	C4	
	54	182	NNW	SFR	C6	
		466	NNE	SFR	C3	
		485	N	SFR	C4	
	55	261	W	SFR	E2	
		262	W	SFR	E7	
		262	W	SFR	E1	
		430	SW	SFR	C6	
		449	WSW	SFR	E6	
	62	326	E	Industrial	C5	71, 146, 154, 164, 170, 175, 176, 178, 179, 184, 185, 186, 187, 191, 192, 216, 217, 218, 219, 221
		418	S	Industrial	C7	
	63	398	S	SFR	C23	146, 154, 169, 170, 174, 175, 176, 178, 179, 184, 185, 186, 187, 191, 192, 217, 218, 219
		471	W	SFR	C5	
	64	459	N	SFR	C8	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146
		470	E	SFR	C5	
	65	383	E	SFR	C5	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146
		420	N	SFR	C8	
	66	258	E	SFR	C5	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146
		425	N	SFR	C8	
		505	NNE	SFR	C22	
	67	164	E	SFR	C5	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146
		359	N	SFR	C8	
		421	NNE	SFR	C22	
	68	160	E	SFR	C5	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146
		273	N	SFR	C8	
		315	NNE	SFR	C22	

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\* Direction represents the distance beginning from the habitable structure towards the provided link.

† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.

## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
	69	169	E	SFR	C5	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146
		203	N	SFR	C8	
		263	NE	SFR	C22	
	70	260	N	SFR	C8	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146
		462	E	SFR	C5	
	71	244	N	SFR	C8	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146
		397	E	SFR	C5	
		473	ENE	SFR	C22	
	72	249	N	SFR	C8	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146
		332	E	SFR	C5	
		415	NE	SFR	C22	
	73	100	S	Recreational	C8	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146
		247	ESE	Recreational	C5	
		247	ESE	Recreational	C22	
	74	262	S	Recreational	C8	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146
		348	SE	Recreational	C5	
		348	SE	Recreational	C22	
2 (15 HS)	75	498	S	SFR	C8	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146
		498	S	SFR	C5	
		498	S	SFR	C22	
	76	473	S	SFR	C5	
		473	S	SFR	C8	
		473	S	SFR	C22	
	77	436	S	SFR	C5	
		436	S	SFR	C8	
		436	S	SFR	C22	
	78	411	SSW	SFR	C5	
		411	SSW	SFR	C8	
		411	SSW	SFR	C22	
	79	394	SSW	SFR	C5	
		394	SSW	SFR	C8	
		394	SSW	SFR	C22	
	80	392	SSW	SFR	C22	
		393	SSW	SFR	C5	
		393	SSW	SFR	C8	
	81	369	SSW	SFR	C22	
		378	SW	SFR	C5	
		378	SW	SFR	C8	
	82	359	SSW	SFR	C22	
		382	SW	SFR	C5	
		382	SW	SFR	C8	
	83	336	SSW	SFR	C22	
		377	SW	SFR	C5	
		377	SW	SFR	C8	
	84	324	SSW	SFR	C22	
		383	SW	SFR	C5	
		383	SW	SFR	C8	
	85	310	SSW	SFR	C22	
		399	WSW	SFR	C5	
		399	WSW	SFR	C8	
	86	515	SSW	SFR	C22	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143
	87	500	SSW	SFR	C22	
	88	485	SSW	SFR	C22	
	89	477	SSW	SFR	C22	
3 (89 HS)	90	489	SW	SFR	F3	67, 68, 69, 70, 92, 94, 96, 103, 108, 186, 187, 191, 192, 217, 218, 219
	91	433	SW	SFR	F3	
	92	355	SW	SFR	F3	
	93	324	SW	SFR	F3	
	94	275	SW	SFR	F3	
	95	255	WSW	SFR	F3	
	96	224	WSW	SFR	F3	

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† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.

# HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
(HS Group 3 cont.)	97	424	WSW	SFR	F3	
	98	466	WSW	SFR	F3	
	99	511	WSW	SFR	F3	
	100	374	WSW	SFR	F3	
	101	423	W	SFR	F3	
	102	472	W	SFR	F3	
	103	210	W	SFR	F3	
	104	209	W	SFR	F3	
	105	212	W	SFR	F3	
	106	210	W	SFR	F3	
	107	210	W	SFR	F3	
	108	206	W	SFR	F3	
	109	211	W	SFR	F3	67, 68, 69, 70, 92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 186, 187, 191, 192, 216, 217, 218, 219
		473	S	SFR	E8	
		518	SSW	SFR	F2	
	110	206	W	SFR	F3	
		423	S	SFR	E8	
		469	SSW	SFR	F2	
	111	213	W	SFR	F3	
		373	S	SFR	E8	
		427	SSW	SFR	F2	
	112	221	W	SFR	F3	
		322	S	SFR	E8	
		389	SW	SFR	F2	
	113	216	W	SFR	F3	
		258	S	SFR	E8	
		335	SW	SFR	F2	
	114	206	S	SFR	E8	
		207	W	SFR	F3	
		291	SW	SFR	F2	
	115	129	S	SFR	E8	
		218	W	SFR	F3	
		270	WSW	SFR	F2	
	116	75	S	SFR	E8	
		284	W	SFR	F3	
		299	WSW	SFR	F2	
	117	78	S	SFR	E8	
		354	W	SFR	F3	
		366	WSW	SFR	F2	
	118	78	S	SFR	E8	
		405	W	SFR	F3	
		412	W	SFR	F2	
	119	77	S	SFR	E8	
		455	W	SFR	F3	
		462	W	SFR	F2	
	120	72	S	SFR	E8	
		504	W	SFR	F3	
		509	W	SFR	F2	
	121	89	S	SFR	E8	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 186, 187, 191, 192, 216, 217, 218, 219
	122	78	S	SFR	E8	
	123	78	S	SFR	E8	
	124	79	S	SFR	E8	
	125	89	S	SFR	E8	
	126	78	S	SFR	E8	
	127	78	S	SFR	E8	
	128	80	S	SFR	E8	
	129	78	S	SFR	E8	
	130	67	S	SFR	E8	
	131	72	S	SFR	E8	
	132	372	W	SFR	F3	67, 68, 69, 70, 92, 94, 96, 103, 108, 186, 187, 191, 192, 217, 218, 219
	133	373	W	SFR	F3	

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# HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
(HS Group 3 cont.)	134	372	W	SFR	F3	
	135	372	W	SFR	F3	
	136	372	W	SFR	F3	
	137	373	W	SFR	F3	
	138	373	W	SFR	F3	
		482	S	SFR	E8	67, 68, 69, 70, 92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 186, 187, 191, 192, 216, 217, 218, 219
	139	372	W	SFR	F3	
		434	S	SFR	E8	
	140	372	W	SFR	F3	
		384	S	SFR	E8	
	141	333	S	SFR	E8	
		371	W	SFR	F3	
		497	SW	SFR	F2	
	142	283	S	SFR	E8	
		371	W	SFR	F3	
		465	SW	SFR	F2	
	143	234	S	SFR	E8	67, 68, 69, 70, 92, 94, 96, 103, 108, 186, 187, 191, 192, 217, 218, 219
		373	W	SFR	F3	
		439	WSW	SFR	F2	
	144	492	W	SFR	F3	
	145	500	W	SFR	F3	
	146	498	W	SFR	F3	
	147	495	W	SFR	F3	
	148	503	W	SFR	F3	
	149	511	W	SFR	F3	
	150	485	S	SFR	E8	67, 68, 69, 70, 92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 186, 187, 191, 192, 216, 217, 218, 219
		511	W	SFR	F3	
	151	435	S	SFR	E8	
		500	W	SFR	F3	
	152	385	S	SFR	E8	
		511	W	SFR	F3	
	153	334	S	SFR	E8	
		501	W	SFR	F3	
	154	285	S	SFR	E8	
		511	W	SFR	F3	
	155	234	S	SFR	E8	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 186, 187, 191, 192, 216, 217, 218, 219
		504	W	SFR	F3	
	156	375	S	SFR	E8	
	157	371	S	SFR	E8	
	158	372	S	SFR	E8	
	159	364	S	SFR	E8	
	160	376	S	SFR	E8	
	161	395	S	SFR	E8	
	162	414	S	SFR	E8	
	163	475	S	SFR	E8	
	164	239	S	SFR	E8	
	165	239	S	SFR	E8	
	166	239	S	SFR	E8	
	167	239	S	SFR	E8	
	168	239	S	SFR	E8	
	169	239	S	SFR	E8	
	170	250	S	SFR	E8	
	171	284	S	SFR	E8	
	172	282	S	SFR	E8	
	173	362	S	SFR	E8	
	174	412	S	SFR	E8	
	175	463	S	SFR	E8	
	176	368	S	SFR	E8	
	177	423	S	SFR	E8	
	178	473	S	SFR	E8	

Shaded values represent the shortest and longest distance between a habitable structure and a link within a group route subset.

\* Direction represents the distance beginning from the habitable structure towards the provided link.

† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.



## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
4 (27 HS)	179	410	S	SFR	E8	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 186, 187, 191, 192, 216, 217, 218, 219
	180	399	S	SFR	E8	
	181	387	S	SFR	E8	
	182	387	S	SFR	E8	
	183	387	S	SFR	E8	
	184	369	S	SFR	E8	
	185	387	S	SFR	E8	
	186	396	S	SFR	E8	
	187	382	S	SFR	E8	
	188	388	S	SFR	E8	
	189	398	S	SFR	E8	
	190	397	S	SFR	E8	
	191	386	S	SFR	E8	
	192	398	S	SFR	E8	
		492	ESE	SFR	C9	
	193	387	S	SFR	E8	
		438	ESE	SFR	C9	
	194	387	SE	SFR	C9	
		395	S	SFR	E8	
		506	SE	SFR	E3	
	195	281	SE	SFR	C9	
		387	S	SFR	E8	
		426	SSE	SFR	E3	
	196	251	SSE	SFR	C9	
		384	S	SFR	E8	
		407	SSE	SFR	E3	
	197	228	SSE	SFR	C9	
		387	S	SFR	E8	
		394	S	SFR	E3	
	198	201	SSE	SFR	C9	
		387	S	SFR	E8	
		388	S	SFR	E3	
	199	184	SSE	SFR	C9	
		388	S	SFR	E8	
		388	S	SFR	E3	
	200	165	SSE	SFR	C9	
		405	S	SFR	E8	
		405	S	SFR	E3	
	201	141	SSE	SFR	C9	
		417	SSW	SFR	E8	
		417	SSW	SFR	E3	
	202	494	SE	SFR	C9	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138
	203	411	SSE	SFR	C9	
	204	389	SSE	SFR	C9	
	205	353	SSE	SFR	C9	
5 (21 HS)	206	520	E	SFR	E5	142, 143, 146
	207	508	E	SFR	E5	
	208	502	E	SFR	E5	
	209	510	E	SFR	E5	
	210	346	SSE	SFR	C9	
		449	E	SFR	E5	92, 94, 96, 103, 108, 116, 117, 119, 130, 132, 137, 138, 142, 143, 146
	211	408	SSE	SFR	C9	
		441	E	SFR	E5	
	212	419	E	SFR	E5	
		480	SSE	SFR	C9	
	213	424	E	SFR	E5	142, 143, 146
	214	406	E	SFR	E5	
	215	387	E	SFR	E5	
	216	377	E	SFR	E5	
	217	362	E	SFR	E5	
	218	343	E	SFR	E5	

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\* Direction represents the distance beginning from the habitable structure towards the provided link.

† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.

## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
(HS Group 5 cont.)	219	347	E	SFR	E5	
	220	334	E	SFR	E5	
	221	336	E	SFR	E5	
	222	342	E	SFR	E5	
	223	361	E	SFR	E5	
	224	394	E	SFR	E5	
	225	440	E	SFR	E5	
	226	481	E	SFR	E5	
6 (29 HS)	227	517	E	SFR	E5	142, 143, 146
	228	518	E	SFR	E5	
	229	508	E	SFR	E5	
	230	501	E	SFR	E5	
	231	498	E	SFR	E5	
	232	401	E	SFR	E5	
	233	396	E	SFR	E5	
	234	389	E	SFR	E5	
	235	381	E	SFR	E5	
	236	379	E	SFR	E5	
	237	372	E	SFR	E5	
	238	386	E	SFR	E5	
	239	456	E	SFR	E5	
	240	328	E	SFR	E5	
	241	277	E	SFR	E5	
	242	245	E	SFR	E5	
	243	240	E	SFR	E5	
	244	241	E	SFR	E5	
	245	228	E	SFR	E5	
	246	205	E	SFR	E5	
	247	223	E	SFR	E5	
	248	200	E	SFR	E5	
	249	212	E	SFR	E5	
	250	212	E	SFR	E5	
	251	224	E	SFR	E5	
	252	272	E	SFR	E5	
	253	349	E	SFR	E5	
	254	408	E	SFR	E5	
	255	483	E	SFR	E5	
	256	257	N	SFR	F1	1, 3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 22, 23, 24, 25, 26, 28, 29, 33, 36, 41, 42, 43, 44, 54, 58, 61, 63, 65, 71, 72, 78, 86, 87, 116, 117, 119, 130, 132, 137, 138, 154, 164, 170, 175, 176, 178, 179, 184, 185, 199, 200, 207, 216, 221
		275	S	SFR	E6	
	257	118	S	SFR	E6	1, 3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 22, 23, 24, 25, 26, 28, 29, 33, 36, 41, 42, 43, 44, 54, 58, 61, 63, 65, 71, 72, 78, 86, 87, 116, 117, 119, 130, 132, 137, 138, 154, 164, 170, 175, 176, 178, 179, 184, 185, 199, 200, 207, 216, 221
		423	N	SFR	F1	
	258	333	NNE	SFR	G3	19, 28, 29, 33, 36, 41, 42, 43, 44, 54, 58, 71, 86, 87, 130, 132, 137, 138, 154, 170, 175, 176, 178, 184, 185, 207, 216, 221
	259	454	N	Industrial	G4	1, 65, 67, 68, 69, 72, 92, 94, 96, 103, 186, 187, 191, 192, 217, 218, 219
	260	459	N	Educational	H6	142
	261	496	N	Educational	H6	142
	262	448	N	Educational	H6	142
	263	72	NNW	SFR	J4	1, 19, 65, 67, 68, 69, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 191, 192, 219
	264	179	NNW	SFR	J4	1, 19, 65, 67, 68, 69, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 191, 192, 219

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\* Direction represents the distance beginning from the habitable structure towards the provided link.

† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.

## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
	265	494	S	Commercial	J4	1, 19, 65, 67, 68, 69, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 191, 192, 219
	266	378	S	MFR	J4	1, 19, 65, 67, 68, 69, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 191, 192, 219
	267	212	S	MFR	J4	1, 19, 65, 67, 68, 69, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 191, 192, 219
	268	58	S	MFR	J4	1, 19, 65, 67, 68, 69, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 191, 192, 219
	269	365	S	MFR	J4	1, 19, 65, 67, 68, 69, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 191, 192, 219
	270	213	S	MFR	J4	1, 19, 65, 67, 68, 69, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 191, 192, 219
	271	109	S	MFR	J4	1, 19, 65, 67, 68, 69, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 191, 192, 219
	272	148	S	MFR	J4	1, 19, 65, 67, 68, 69, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 191, 192, 219
7 (36 HS)	273	505	S	SFR	J4	1, 19, 65, 67, 68, 69, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 191, 192, 219
	274	506	S	SFR	J4	
	275	505	S	SFR	J4	
	276	321	S	SFR	J4	
	277	216	S	SFR	J4	
	278	137	S	SFR	J4	
	279	125	SSE	SFR	J4	
	280	151	SSE	SFR	J4	
	281	148	SSE	SFR	J4	
	282	160	SSE	SFR	J4	
	283	173	SSE	SFR	J4	
	284	193	SSE	SFR	J4	
	285	217	SSE	SFR	J4	
	286	264	SSE	SFR	J4	
	287	265	SSW	SFR	J4	
	288	253	SSW	SFR	J4	
	289	268	SSW	SFR	J4	
	290	293	SSW	SFR	J4	
	291	267	SSW	SFR	J4	
	292	269	SSW	SFR	J4	
	293	308	SSE	SFR	J4	
	294	317	SSE	SFR	J4	
	295	324	SSE	SFR	J4	
	296	331	SSE	SFR	J4	
	297	340	SSE	SFR	J4	
	298	366	SSE	SFR	J4	
	299	409	SSE	SFR	J4	
	300	435	SSW	SFR	J4	
	301	430	SSW	SFR	J4	
	302	434	SSW	SFR	J4	
	303	501	SSW	SFR	J4	
	304	417	SSE	SFR	J4	
	305	448	SSE	SFR	J4	
	306	457	SSE	SFR	J4	
	307	456	SSE	SFR	J4	
	308	471	SSE	SFR	J4	
8 (57 HS)	309	236	NNW	SFR	J4	1, 19, 65, 67, 68, 69, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 191, 192, 219
	310	208	NNW	SFR	J4	
	311	186	NNW	SFR	J4	
	312	160	NNW	SFR	J4	
	313	128	N	SFR	J4	
	314	130	N	SFR	J4	
	315	119	NNE	SFR	J4	
	316	127	NNE	SFR	J4	

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# HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
(HS Group 8 cont.)	317	137	NNE	SFR	J4	
	318	131	NNE	SFR	J4	
	319	133	NNE	SFR	J4	
	320	127	NNE	SFR	J4	
	321	120	NNE	SFR	J4	
	322	128	NNE	SFR	J4	
	323	116	NNE	SFR	J4	
	324	110	NNE	SFR	J4	
	325	119	NNE	SFR	J4	
	326	105	NNE	SFR	J4	
	327	97	NNE	SFR	J4	
	328	81	NNE	SFR	J4	
	329	63	NNE	SFR	J4	
	330	370	NNW	SFR	J4	
	331	422	NNW	SFR	J4	
	332	477	NNW	SFR	J4	
	333	317	NNW	SFR	J4	
	334	387	NNW	SFR	J4	
	335	322	NNW	SFR	J4	
	336	309	N	SFR	J4	
	337	304	NNE	SFR	J4	
	338	506	NNW	SFR	J4	
	339	473	N	SFR	J4	
	340	455	N	SFR	J4	
	341	467	N	SFR	J4	
	342	467	N	SFR	J4	
	343	300	NNE	SFR	J4	
	344	487	NNE	SFR	J4	
	345	299	NNE	SFR	J4	
	346	354	NNE	SFR	J4	
	347	421	NNE	SFR	J4	
	348	350	NNE	SFR	J4	
	348.01	284	NNE	SFR	J4	
	349	411	NNE	SFR	J4	
	350	298	NNE	SFR	J4	
	351	371	NNE	SFR	J4	
	352	432	NNE	SFR	J4	
	353	494	NNE	SFR	J4	
	354	334	NNE	SFR	J4	
	355	395	NNE	SFR	J4	
	356	456	NNE	SFR	J4	
	357	270	NNE	SFR	J4	
	358	392	NNE	SFR	J4	
	359	515	NNE	SFR	J4	
	360	227	NNE	SFR	J4	
	361	296	NNE	SFR	J4	
	362	364	NNE	SFR	J4	
	363	487	NNE	SFR	J4	
	364	139	S	SFR	J4	1, 19, 65, 67, 68, 69, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 191, 192, 219
	365	54	S	SFR	H8	33, 36, 41, 42, 43, 44, 54, 58, 70, 71, 86, 87, 137, 138, 154, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 221
		374	E	SFR	H9	
		374	E	SFR	H42	
	366	395	N	SFR	H8	33, 36, 41, 42, 43, 44, 54, 58, 70, 71, 86, 87, 137, 138, 154, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 221
	367	228	WNW	SFR	H8	33, 36, 41, 42, 43, 44, 54, 58, 70, 71, 86, 87, 137, 138, 154, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 221

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† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.

# HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
	368	84	WNW	SFR	H8	33, 36, 41, 42, 43, 44, 54, 58, 70, 71, 86, 87, 137, 138, 154, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 221
	369	91	N	Commercial	I8	29, 33, 36, 41, 42, 43, 44, 54, 58, 70, 71, 86, 87, 116, 130, 132, 137, 138, 154, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 221
		457	S	Commercial	I7	
		476	ESE	Commercial	I6	
		517	E	Commercial	H8	
		517	E	Commercial	I5	
	370	76	N	Commercial	I8	29, 33, 36, 41, 42, 54, 71, 86, 116, 130, 132, 137, 138, 154, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 221
		505	S	Commercial	I7	
	371	187	N	Commercial	I8	29, 33, 36, 41, 42, 54, 71, 86, 116, 130, 132, 137, 138, 154, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 221
		419	S	Commercial	I7	
9 (22 HS)	372	127	E	SFR	J3	29, 33, 36, 41, 42, 54, 71, 86, 116, 130, 132, 137, 138, 154, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 221
	373	138	E	SFR	J3	
	374	113	E	SFR	J3	
	375	338	E	SFR	J3	
	376	423	N	SFR	J3	
	377	424	N	SFR	J3	
	378	425	N	SFR	J3	
	379	431	N	SFR	J3	
	380	449	NNE	SFR	J3	
	381	496	NNE	SFR	J3	
	382	65	N	SFR	J3	
	383	213	N	SFR	J3	
	384	190	N	SFR	J3	
	385	210	N	SFR	J3	
	386	231	N	SFR	J3	
	387	253	NNE	SFR	J3	
	388	323	NE	SFR	J3	
	389	386	ENE	SFR	J3	
	390	501	ENE	SFR	J3	
	391	483	N	SFR	J3	
	392	354	N	SFR	J3	
	393	220	N	SFR	J3	
10 (12 HS)	394	503	WSW	SFR	J3	29, 33, 36, 41, 42, 54, 71, 86, 116, 130, 132, 137, 138, 154, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 221
	395	457	WSW	SFR	J3	
	396	407	WSW	SFR	J3	
	397	359	WSW	SFR	J3	
	398	313	WSW	SFR	J3	
	399	396	SW	SFR	J3	
	400	433	SW	SFR	J3	
	401	471	SW	SFR	J3	
	402	262	SSW	SFR	J3	
	403	398	SSW	SFR	J3	
	404	450	SSW	SFR	J3	
	405	494	SSW	SFR	J3	
11 (28 HS)	406	119	S	SFR	J3	29, 33, 36, 41, 42, 54, 71, 86, 116, 130, 132, 137, 138, 154, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 221
	407	229	S	SFR	J3	
	408	361	S	SFR	J3	
	409	456	S	SFR	J3	
	410	202	S	SFR	J3	
	411	286	W	SFR	J3	
	412	294	W	SFR	J3	
	413	366	WSW	SFR	J3	
	414	281	SW	SFR	J3	
	415	202	SSW	SFR	J3	
	416	157	S	SFR	J3	
	417	172	S	SFR	J3	

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## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
(HS Group 11 cont.)	418	153	S	SFR	J3	
	419	153	S	SFR	J3	
	420	154	S	SFR	J3	
	421	168	S	SFR	J3	
	422	170	S	SFR	J3	
	423	170	S	SFR	J3	
	424	493	SW	SFR	J3	
	425	425	SSW	SFR	J3	
	426	389	S	SFR	J3	
	427	387	S	SFR	J3	
	428	374	S	SFR	J3	
	429	482	S	SFR	J3	
	430	385	S	SFR	J3	
	431	386	S	SFR	J3	
	432	387	S	SFR	J3	
	433	387	S	SFR	J3	
	434	87	S	SFR	I31	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 61, 63, 78, 199, 200
	435	79	S	SFR	I31	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 61, 63, 78, 199, 200
	436	111	ESE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	437	289	N	Commercial	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	438	502	N	Commercial	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	439	497	N	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	440	318	N	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	441	462	N	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	442	448	NNW	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	443	279	NNW	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	444	353	NNW	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	445	166	NNW	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	446	281	NNW	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	447	233	N	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	448	299	N	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	449	129	N	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	450	331	N	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	451	315	N	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	452	337	N	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	453	320	N	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	454	307	N	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	455	265	NNE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	456	315	NE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200

Shaded values represent the shortest and longest distance between a habitable structure and a link within a group route subset.

\* Direction represents the distance beginning from the habitable structure towards the provided link.

† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.

## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
	457	511	WSW	Commercial	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	458	403	SW	Commercial	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	459	514	SW	Commercial	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	460	385	SSW	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	461	447	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	462	380	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	463	357	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	464	374	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	465	352	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	466	307	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	467	464	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	468	344	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	469	483	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	470	328	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	471	455	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	472	378	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	473	501	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	474	371	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	475	370	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	476	353	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	477	510	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	478	369	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	479	374	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	480	287	SW	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	481	214	SSW	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	482	114	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	483	119	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	484	109	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	485	93	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	486	86	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	487	102	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	488	114	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200

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\* Direction represents the distance beginning from the habitable structure towards the provided link.

† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.

# HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
	489	115	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	490	112	S	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	491	116	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	492	113	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	493	111	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	494	98	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	495	109	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	496	70	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	497	84	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	498	110	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	499	99	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	500	101	SSE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
12 (29 HS)	501	473	N	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	502	403	N	SFR	J22	
	503	385	N	SFR	J22	
	504	406	N	SFR	J22	
	505	483	N	SFR	J22	
	506	503	N	SFR	J22	
	507	421	N	SFR	J22	
	508	374	N	SFR	J22	
	509	399	NNW	SFR	J22	
	510	471	NNW	SFR	J22	
	511	477	NNW	SFR	J22	
	512	406	NNW	SFR	J22	
	513	378	NNW	SFR	J22	
	514	382	NNW	SFR	J22	
	515	427	NNW	SFR	J22	
	516	493	NNW	SFR	J22	
	517	490	NNW	SFR	J22	
	518	505	NNW	SFR	J22	
	519	493	NNW	SFR	J22	
	520	481	NNW	SFR	J22	
	521	481	NNW	SFR	J22	
	522	464	NNW	SFR	J22	
	523	448	NNW	SFR	J22	
	524	432	NNW	SFR	J22	
	525	414	NNW	SFR	J22	
	526	393	NNW	SFR	J22	
	527	400	NNW	SFR	J22	
	528	457	NNW	SFR	J22	
	529	507	NNW	SFR	J22	
13 (21 HS)	530	481	WNW	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	531	455	NW	SFR	J22	
	532	426	NW	SFR	J22	
	533	371	NW	SFR	J22	
	534	343	NW	SFR	J22	
	535	303	NNW	SFR	J22	
	536	248	NNW	SFR	J22	
	537	232	NW	SFR	J22	

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## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
(HS Group 13 cont.)	538	503	NW	SFR	J22	
	539	468	NNW	SFR	J22	
	540	445	NNW	SFR	J22	
	541	416	NNW	SFR	J22	
	542	125	NNW	SFR	J22	
	543	176	NNW	SFR	J22	
	544	213	NNW	SFR	J22	
	545	266	NNW	SFR	J22	
	546	308	NNW	SFR	J22	
	547	347	NNW	SFR	J22	
	548	391	NNW	SFR	J22	
	549	435	NNW	SFR	J22	
	550	483	NNW	SFR	J22	
14 (13 HS)	551	419	SE	SFR	J22	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200
	552	416	SE	SFR	J22	
	553	424	SE	SFR	J22	
	554	429	SE	SFR	J22	
	555	432	SE	SFR	J22	
	555.01	429	SE	SFR	J22	
	556	438	SE	SFR	J22	
	557	441	SE	SFR	J22	
	558	450	SE	SFR	J22	
	559	466	SE	SFR	J22	
	560	478	SE	SFR	J22	
	561	492	SE	SFR	J22	
	562	506	SE	SFR	J22	
15 (7 HS)	563	408	SSW	SFR	L1	3, 5, 10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 28, 43, 44, 58, 61, 63, 70, 78, 87, 117, 119, 164, 199, 200
	564	419	SSW	SFR	L1	
	565	265	SSW	SFR	L1	
	566	267	SSW	SFR	L1	
	567	291	SW	SFR	L1	
	568	313	SW	SFR	L1	
	569	342	SW	SFR	L1	
16 (39 HS)	570	345	NNE	SFR	I12	3, 5, 28, 117, 119, 164
	571	359	NNE	SFR	I12	
	572	339	NNE	SFR	I12	
	573	298	NNE	SFR	I12	
	573.01	275	NNE	SFR	I12	
	573.02	324	NNE	SFR	I12	
	573.02	398	NNE	SFR	I12	
	574	517	NNE	SFR	I12	
	575	480	NNE	SFR	I12	
	576	466	NNE	SFR	I12	
	577	450	NNE	SFR	I12	
	578	435	NNE	SFR	I12	
	579	421	NNE	SFR	I12	
	579.01	406	NNE	SFR	I12	
	579.02	260	NNE	SFR	I12	
	579.03	245	NNE	SFR	I12	
	580	389	NNE	SFR	I12	
	581	376	NNE	SFR	I12	
	582	360	NNE	SFR	I12	
	583	347	NNE	SFR	I12	
	584	332	NNE	SFR	I12	
	585	315	NNE	SFR	I12	
	586	301	NNE	SFR	I12	
	587	504	NNE	SFR	I12	
	588	486	NNE	SFR	I12	
	589	487	NNE	SFR	I12	

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## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
(HS Group 16 cont.)	590	455	NNE	SFR	I12	
	591	448	NNE	SFR	I12	
	592	432	NNE	SFR	I12	
	593	266	NNE	SFR	I12	
	594	314	NNE	SFR	I12	
	595	363	NNE	SFR	I12	
	596	403	NE	SFR	I12	
	597	253	NE	Educational	I12	3, 5, 28, 117, 119, 164
17 (7 HS)	598	478	SSW	SFR	I12	3, 5, 28, 117, 119, 164
	599	486	SSW	SFR	I12	
	600	487	SSW	SFR	I12	
	601	488	SSW	SFR	I12	
	602	494	SSW	SFR	I12	
	603	505	SSW	SFR	I12	
	604	516	SW	SFR	I12	
	605	475	SW	SFR	I12	3, 5, 28, 117, 119, 164
	606	498	WSW	SFR	I12	3, 5, 28, 117, 119, 164
18 (HS 21)	607	498	WSW	SFR	I12	3, 5, 28, 117, 119, 164
	608	500	WSW	SFR	I12	
	609	474	WSW	SFR	I12	
	610	472	WSW	SFR	I12	
	611	465	WSW	SFR	I12	
	612	451	WSW	SFR	I12	
	613	452	WSW	SFR	I12	
	614	427	WSW	SFR	I12	
	615	422	WSW	SFR	I12	
	616	455	WSW	SFR	I12	
	617	446	WSW	SFR	I12	
	618	453	WSW	SFR	I12	
	619	471	WSW	SFR	I12	
	620	488	WSW	SFR	I12	
	621	509	WSW	SFR	I12	
	622	500	SSW	SFR	I12	
	623	497	SSW	SFR	I12	
	624	492	SSW	SFR	I12	
	625	505	SSW	SFR	I12	
	626	495	SSW	SFR	I12	
	627	505	SSW	SFR	I12	
	628	477	ESE	Commercial	I12	3, 5, 28, 117, 119, 164
	629	339	S	Industrial	I12	3, 5, 28, 117, 119, 164
	630	353	S	Industrial	I12	3, 5, 28, 117, 119, 164
	631	135	WNW	Industrial	I12	3, 5, 28, 117, 119, 164
	632	103	N	Industrial	I12	3, 5, 28, 117, 119, 164
	633	403	N	Industrial	I12	3, 5, 28, 117, 119, 164
	634	355	WNW	Industrial	I12	3, 5, 28, 117, 119, 164
	635	429	S	SFR	K1	29, 33, 36, 41, 42, 54, 71, 86, 92, 94, 108, 116, 130, 132, 137, 138, 146, 154, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 219, 221
	636	140	S	SFR	K1	29, 33, 36, 41, 42, 54, 71, 86, 92, 94, 108, 116, 130, 132, 137, 138, 146, 154, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 219, 221
	637	90	S	SFR	K1	29, 33, 36, 41, 42, 54, 71, 86, 92, 94, 108, 116, 130, 132, 137, 138, 146, 154, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 219, 221
	638	112	N	SFR	K1	29, 33, 36, 41, 42, 54, 71, 86, 92, 94, 108, 116, 130, 132, 137, 138, 146, 154, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 219, 221

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## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
	639	85	N	SFR	K1	29, 33, 36, 41, 42, 54, 71, 86, 92, 94, 108, 116, 130, 132, 137, 138, 146, 154, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 219, 221
	640	440	N	SFR	K1	29, 33, 36, 41, 42, 54, 71, 86, 92, 94, 108, 116, 130, 132, 137, 138, 146, 154, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 219, 221
	641	453	N	SFR	K1	29, 33, 36, 41, 42, 54, 71, 86, 92, 94, 108, 116, 130, 132, 137, 138, 146, 154, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 219, 221
	642	365	W	SFR	L5	19, 29, 33, 36, 41, 42, 54, 71, 86, 92, 94, 103, 108, 116, 130, 132, 137, 138, 146, 154, 170, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 219, 221
	643	253	W	SFR	L5	19, 29, 33, 36, 41, 42, 54, 71, 86, 92, 94, 103, 108, 116, 130, 132, 137, 138, 146, 154, 170, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 219, 221
	644	344	W	SFR	L5	19, 29, 33, 36, 41, 42, 54, 71, 86, 92, 94, 103, 108, 116, 130, 132, 137, 138, 146, 154, 170, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 219, 221
	645	388	WNW	SFR	L5	19, 29, 33, 36, 41, 42, 54, 71, 86, 92, 94, 103, 108, 116, 130, 132, 137, 138, 146, 154, 170, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 219, 221
	646	501	NW	SFR	L5	19, 29, 33, 36, 41, 42, 54, 71, 86, 92, 94, 103, 108, 116, 130, 132, 137, 138, 146, 154, 170, 175, 176, 178, 179, 184, 185, 186, 187, 207, 216, 217, 218, 219, 221
	647	335	S	SFR	M8	1, 65, 67, 68, 69, 72, 96, 142, 143, 191, 192
	648	520	N	SFR	M8	1, 65, 67, 68, 69, 72, 96, 142, 143, 191, 192
	649	518	N	SFR	M8	1, 65, 67, 68, 69, 72, 96, 142, 143, 191, 192
	650	488	N	SFR	M8	1, 65, 67, 68, 69, 72, 96, 142, 143, 191, 192
	651	511	N	SFR	M8	1, 65, 67, 68, 69, 72, 96, 142, 143, 191, 192
	652	519	N	SFR	M8	1, 65, 67, 68, 69, 72, 96, 142, 143, 191, 192
	653	448	N	SFR	M8	1, 65, 67, 68, 69, 72, 96, 142, 143, 191, 192
	654	515	N	SFR	M8	1, 65, 67, 68, 69, 72, 96, 142, 143, 191, 192
	655	519	N	SFR	M8	1, 65, 67, 68, 69, 72, 96, 142, 143, 191, 192
	656	516	N	SFR	M8	1, 65, 67, 68, 69, 72, 96, 142, 143, 191, 192
	657	511	N	SFR	M8	1, 65, 67, 68, 69, 72, 96, 142, 143, 191, 192
	658	484	N	SFR	M8	1, 65, 67, 68, 69, 72, 96, 142, 143, 191, 192
	659	508	N	SFR	M8	1, 65, 67, 68, 69, 72, 96, 142, 143, 191, 192
	660	385	N	SFR	O8	67, 68, 69
	661	382	N	SFR	O8	67, 68, 69
	662	363	N	SFR	O8	67, 68, 69
	663	341	N	SFR	O8	67, 68, 69
	664	337	N	SFR	O8	67, 68, 69
	665	498	N	SFR	O8	67, 68, 69
	666	315	N	SFR	O8	67, 68, 69

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## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
	667	303	N	SFR	O8	67, 68, 69
	668	205	N	SFR	O8	67, 68, 69
	669	227	N	SFR	O8	67, 68, 69
	670	190	N	SFR	O8	67, 68, 69
	671	190	N	SFR	O8	67, 68, 69
	672	375	N	SFR	O8	67, 68, 69
		382	N	SFR	Q2	
	673	101	W	SFR	Q2	67, 68, 69
		514	SSW	SFR	Q5	
		514	SSW	SFR	Q1	
	674	307	NW	SFR	T2	68
	675	341	WNW	SFR	T2	68
	676	434	WNW	SFR	T2	68
	677	505	WNW	SFR	T2	68
	678	518	WNW	SFR	T2	68
	679	404	WNW	SFR	T2	68
	680	379	S	SFR	S5	1, 41, 42, 65, 67, 71, 72, 86, 94, 96, 103, 117, 138, 142, 143, 175, 176, 184, 185, 207
		489	SE	SFR	S2	
		497	SE	SFR	S3	
	681	461	SE	SFR	S2	1, 41, 42, 65, 67, 71, 72, 86, 94, 96, 103, 117, 138, 142, 143, 175, 176, 184, 185, 207
	682	249	SE	SFR	S2	1, 41, 42, 65, 67, 71, 72, 86, 94, 96, 103, 117, 138, 142, 143, 175, 176, 184, 185, 207
	683	181	S	SFR	S2	1, 41, 42, 65, 67, 71, 72, 86, 94, 96, 103, 117, 138, 142, 143, 175, 176, 184, 185, 207
	684	248	S	SFR	S2	1, 41, 42, 65, 67, 71, 72, 86, 94, 96, 103, 117, 138, 142, 143, 175, 176, 184, 185, 207
	685	256	S	SFR	S2	1, 41, 42, 65, 67, 71, 72, 86, 94, 96, 103, 117, 138, 142, 143, 175, 176, 184, 185, 207
	686	456	S	SFR	S2	1, 41, 42, 65, 67, 71, 72, 86, 94, 96, 103, 117, 138, 142, 143, 175, 176, 184, 185, 207
	687	395	S	SFR	S2	1, 41, 42, 65, 67, 71, 72, 86, 94, 96, 103, 117, 138, 142, 143, 175, 176, 184, 185, 207
	688	219	SSW	SFR	S2	1, 41, 42, 65, 67, 71, 72, 86, 94, 96, 103, 117, 138, 142, 143, 175, 176, 184, 185, 207
	689	428	W	SFR	Q1	67
	690	422	S	SFR	O7	1, 41, 42, 65, 71, 72, 86, 94, 96, 103, 138, 142, 143, 175, 176, 184, 185, 207, 217, 218, 219, 221
	691	259	S	SFR	O7	1, 41, 42, 65, 71, 72, 86, 94, 96, 103, 138, 142, 143, 175, 176, 184, 185, 207, 217, 218, 219, 221
	692	368	S	SFR	O7	1, 41, 42, 65, 71, 72, 86, 94, 96, 103, 138, 142, 143, 175, 176, 184, 185, 207, 217, 218, 219, 221
	693	259	S	SFR	O7	1, 41, 42, 65, 71, 72, 86, 94, 96, 103, 138, 142, 143, 175, 176, 184, 185, 207, 217, 218, 219, 221
	694	519	S	SFR	M7	41, 42, 54, 71, 86, 94, 103, 138, 175, 176, 184, 185, 207, 217, 218, 219, 221
	695	482	S	SFR	M7	41, 42, 54, 71, 86, 94, 103, 138, 175, 176, 184, 185, 207, 217, 218, 219, 221
	696	324	S	SFR	M7	41, 42, 54, 71, 86, 94, 103, 138, 175, 176, 184, 185, 207, 217, 218, 219, 221

Shaded values represent the shortest and longest distance between a habitable structure and a link within a group route subset.

\* Direction represents the distance beginning from the habitable structure towards the provided link.

† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.

## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
	697	307	S	SFR	M7	41, 42, 54, 71, 86, 94, 103, 138, 175, 176, 184, 185, 207, 217, 218, 219, 221
	698	470	S	SFR	M7	41, 42, 54, 71, 86, 94, 103, 138, 175, 176, 184, 185, 207, 217, 218, 219, 221
	699	184	S	SFR	L2	3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 22, 23, 24, 25, 26, 28, 29, 33, 36, 43, 44, 58, 61, 63, 70, 78, 87, 92, 108, 116, 117, 119, 130, 132, 137, 146, 154, 164, 170, 178, 179, 186, 187, 199, 200, 216
	700	341	N	SFR	L2	3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 22, 23, 24, 25, 26, 28, 29, 33, 36, 43, 44, 58, 61, 63, 70, 78, 87, 92, 108, 116, 117, 119, 130, 132, 137, 146, 154, 164, 170, 178, 179, 186, 187, 199, 200, 216
		366	W	SFR	M1	
		498	NW	SFR	M6	
	701	302	E	SFR	M1	3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 22, 23, 24, 25, 26, 28, 29, 33, 36, 43, 44, 58, 61, 63, 70, 78, 87, 92, 108, 116, 117, 119, 130, 132, 137, 146, 154, 164, 170, 178, 179, 186, 187, 199, 200, 216
		457	N	SFR	M6	
	702	424	N	Commercial	M1	3, 5, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 28, 29, 36, 43, 44, 58, 61, 63, 70, 78, 87, 108, 116, 119, 130, 132, 137, 146, 164, 179, 199, 200
19 (42 HS)	703	475	N	SFR	O5	10, 11, 19, 33, 54, 92, 117, 154, 170, 178, 186, 187, 191, 192, 216
	704	437	N	SFR	O5	
	705	392	N	SFR	O5	
	706	343	N	SFR	O5	
	707	294	N	SFR	O5	
	708	245	N	SFR	O5	
	709	152	N	SFR	O5	
	710	120	N	SFR	O5	
	711	135	N	SFR	O5	
	712	125	N	SFR	O5	
	713	133	N	SFR	O5	
	714	123	N	SFR	O5	
	715	128	N	SFR	O5	
	716	131	N	SFR	O5	
	717	141	N	SFR	O5	
	718	130	N	SFR	O5	
	719	131	N	SFR	O5	
	720	116	N	SFR	O5	
	721	142	N	SFR	O5	
	722	506	N	SFR	O5	
	723	454	N	SFR	O5	
	724	393	N	SFR	O5	
	725	282	N	SFR	O5	
	726	282	N	SFR	O5	
	727	281	N	SFR	O5	
	728	281	N	SFR	O5	
	729	281	N	SFR	O5	
	730	405	N	SFR	O5	
	731	448	N	SFR	O5	
	732	495	N	SFR	O5	
	733	505	N	SFR	O5	
	734	467	N	SFR	O5	
	735	424	N	SFR	O5	
	736	377	N	SFR	O5	
	737	282	N	SFR	O5	
	738	283	N	SFR	O5	
	739	318	N	SFR	O5	
	740	515	N	SFR	O5	

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## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
(HS Group 19 cont.)	741	474	N	SFR	O5	
	742	430	N	SFR	O5	
	743	390	N	SFR	O5	
	744	379	N	SFR	O5	
	745	424	W	Industrial	P1	10, 11, 19, 170, 186, 187, 191, 192
	746	510	NW	Industrial	P1	10, 11, 19, 170, 186, 187, 191, 192
	747	297	W	Industrial	P1	10, 11, 19, 170, 186, 187, 191, 192
	748	285	N	Commercial	P1	10, 11, 19, 170, 186, 187, 191, 192
	749	188	N	Commercial	P1	10, 11, 19, 170, 186, 187, 191, 192
20 (111 HS)	750	495	E	SFR	P1	10, 11, 19, 170, 186, 187, 191, 192
	751	466	E	SFR	P1	
	752	426	E	SFR	P1	
	753	389	E	SFR	P1	
	754	352	E	SFR	P1	
	755	324	E	SFR	P1	
	756	287	E	SFR	P1	
	757	274	E	SFR	P1	
	758	512	E	SFR	P1	
	759	474	E	SFR	P1	
	760	448	E	SFR	P1	
	761	411	E	SFR	P1	
	762	474	E	SFR	P1	
	763	418	E	SFR	P1	
	764	473	E	SFR	P1	
	765	487	S	SFR	P1	
	766	486	S	SFR	P1	
	767	486	S	SFR	P1	
	768	485	S	SFR	P1	
	769	488	S	SFR	P1	
	770	488	S	SFR	P1	
	771	486	S	SFR	P1	
	772	486	S	SFR	P1	
	773	484	S	SFR	P1	
	774	484	S	SFR	P1	
	775	484	S	SFR	P1	
	776	485	S	SFR	P1	
	777	486	S	SFR	P1	
	778	494	S	SFR	P1	
	779	508	S	SFR	P1	
	780	339	S	SFR	P1	
	781	353	S	SFR	P1	
	782	347	S	SFR	P1	
	783	340	S	SFR	P1	
	784	340	S	SFR	P1	
	785	335	S	SFR	P1	
	786	338	S	SFR	P1	
	787	343	S	SFR	P1	
	788	340	S	SFR	P1	
	789	332	S	SFR	P1	
	790	338	S	SFR	P1	
	791	343	S	SFR	P1	
	792	338	S	SFR	P1	
	793	338	S	SFR	P1	
	794	353	S	SFR	P1	
	795	339	S	SFR	P1	
	796	355	S	SFR	P1	
	797	372	S	SFR	P1	
	798	397	S	SFR	P1	
	799	423	S	SFR	P1	

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† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.

## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
(HS Group 20 cont.)	800	473	S	SFR	P1	
	801	508	S	SFR	P1	
	802	224	S	SFR	P1	
	803	225	S	SFR	P1	
	804	228	S	SFR	P1	
	805	227	S	SFR	P1	
	806	227	S	SFR	P1	
	807	226	S	SFR	P1	
	808	226	S	SFR	P1	
	809	226	S	SFR	P1	
	810	225	S	SFR	P1	
	811	227	S	SFR	P1	
	812	224	S	SFR	P1	
	813	224	S	SFR	P1	
	814	224	S	SFR	P1	
	815	223	S	SFR	P1	
	816	224	S	SFR	P1	
	817	229	S	SFR	P1	
	818	237	S	SFR	P1	
	819	254	S	SFR	P1	
	820	276	S	SFR	P1	
	821	311	S	SFR	P1	
	822	334	S	SFR	P1	
	823	368	S	SFR	P1	
	824	414	S	SFR	P1	
	825	454	S	SFR	P1	
	826	503	S	SFR	P1	
	827	276	E	SFR	P1	
	828	283	E	SFR	P1	
	829	290	E	SFR	P1	
	830	272	E	SFR	P1	
	831	279	E	SFR	P1	
	832	284	E	SFR	P1	
	833	237	S	SFR	P1	
	834	168	S	SFR	P1	
	835	77	S	SFR	P1	
	836	65	S	SFR	P1	
	837	79	S	SFR	P1	
	838	85	S	SFR	P1	
	839	80	S	SFR	P1	
	840	75	S	SFR	P1	
	841	90	S	SFR	P1	
	842	86	S	SFR	P1	
	843	95	S	SFR	P1	
	844	84	S	SFR	P1	
	845	80	S	SFR	P1	
	846	67	S	SFR	P1	
	847	87	S	SFR	P1	
	848	88	S	SFR	P1	
	849	93	S	SFR	P1	
	850	81	S	SFR	P1	
	851	86	S	SFR	P1	
	852	69	S	SFR	P1	
	853	84	S	SFR	P1	
	854	97	S	SFR	P1	
	855	101	S	SFR	P1	
	856	121	S	SFR	P1	
	857	145	S	SFR	P1	
	858	173	S	SFR	P1	

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† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.

# HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
(HS Group 20 cont.)	859	204	S	SFR	P1	
	860	258	S	SFR	P1	
21 (81 HS)	861	513	WNW	SFR	P4	54, 217, 219, 221
	862	460	W	SFR	P4	
	863	460	W	SFR	P4	
	864	401	W	SFR	P4	
	865	332	W	SFR	P4	
	866	466	W	SFR	P4	
	867	405	W	SFR	P4	
	868	345	W	SFR	P4	
	869	285	W	SFR	P4	
	870	461	W	SFR	P4	
	871	402	W	SFR	P4	
	872	346	W	SFR	P4	
	873	289	W	SFR	P4	
	874	407	W	SFR	P4	
	875	406	W	SFR	P4	
	876	400	W	SFR	P4	
	877	411	W	SFR	P4	
	878	404	W	SFR	P4	
	879	415	W	SFR	P4	
	880	407	W	SFR	P4	
	881	420	W	SFR	P4	
	882	399	W	SFR	P4	
	883	404	W	SFR	P4	
	884	417	W	SFR	P4	
	885	422	W	SFR	P4	
	886	291	W	SFR	P4	
	887	292	W	SFR	P4	
	888	290	W	SFR	P4	
	889	292	W	SFR	P4	
	890	294	W	SFR	P4	
	891	294	W	SFR	P4	
	892	292	W	SFR	P4	
	893	293	W	SFR	P4	
	894	292	W	SFR	P4	
	895	293	W	SFR	P4	
	896	293	W	SFR	P4	
	897	296	W	SFR	P4	
	898	294	W	SFR	P4	
	899	294	W	SFR	P4	
	900	499	W	SFR	P4	
	901	456	W	SFR	P4	
	902	408	W	SFR	P4	
	903	359	W	SFR	P4	
	904	297	W	SFR	P4	
	905	498	W	SFR	P4	
	906	448	W	SFR	P4	
	907	409	W	SFR	P4	
	908	362	W	SFR	P4	
	909	317	W	SFR	P4	
	910	476	W	SFR	P4	
	911	433	W	SFR	P4	
	912	387	W	SFR	P4	
	913	353	W	SFR	P4	
	914	152	W	SFR	P4	
	915	148	W	SFR	P4	
	916	138	W	SFR	P4	
	917	138	W	SFR	P4	

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## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
(HS Group 21 cont.)	918	148	W	SFR	P4	
	919	151	W	SFR	P4	
	920	138	W	SFR	P4	
	921	148	W	SFR	P4	
	922	138	W	SFR	P4	
	923	141	W	SFR	P4	
	924	139	W	SFR	P4	
	925	138	W	SFR	P4	
	926	153	W	SFR	P4	
	927	148	W	SFR	P4	
	928	140	W	SFR	P4	
	929	152	W	SFR	P4	
	930	139	W	SFR	P4	
	931	149	W	SFR	P4	
	932	143	W	SFR	P4	
	933	139	W	SFR	P4	
	934	139	W	SFR	P4	
	935	151	W	SFR	P4	33, 54, 92, 154, 178, 216, 217, 218, 219, 221
	936	145	W	SFR	P4	
	937	140	W	SFR	P4	
	938	147	W	SFR	P4	
		485	NNW	SFR	S1	
		485	NNW	SFR	P5	
	939	169	W	SFR	P4	
		422	NNW	SFR	S1	
		422	NNW	SFR	P5	
	940	206	W	SFR	P4	
		398	NW	SFR	S1	
		398	NW	SFR	P5	
	941	251	W	SFR	P4	
		384	NW	SFR	S1	
		384	NW	SFR	P5	
	942	386	S	SFR	S1	33, 92, 154, 178, 216, 218
	943	249	S	SFR	S1	33, 92, 154, 178, 216, 218
	944	201	SSW	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	945	132	S	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	946	438	S	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	947	158	SSE	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	948	248	SSE	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	949	322	SSE	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	950	228	N	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	951	321	N	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	952	407	N	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	953	392	N	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	954	179	N	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	955	425	N	Other	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	956	198	N	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	957	382	N	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	958	287	NNW	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	959	199	NNW	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	960	270	NNW	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	961	357	NNW	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	962	124	NNW	SFR	M4	3, 15, 24, 36, 44, 58, 63, 70, 78, 137
	963	467	W	SFR	U2	1, 11, 26, 41, 42, 65, 67, 72, 86, 94, 96, 103, 117, 138, 142, 143, 192, 207, 218
	964	341	W	Commercial	U2	1, 11, 26, 41, 42, 65, 67, 72, 86, 94, 96, 103, 117, 138, 142, 143, 192, 207, 218
	965	158	E	SFR	U2	1, 11, 26, 41, 42, 65, 67, 72, 86, 94, 96, 103, 117, 138, 142, 143, 192, 207, 218
		440	NNE	SFR	R6	103, 117, 138, 142, 143, 192, 207, 218

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## HABITABLE STRUCTURES WITHIN 500 FEET OF THE FILED ALTERNATIVE ROUTES

Habitable Structure Group	Habitable Structure	Distance†	Direction*	Description	Link	Routes
		440	NNE	SFR	U1	
	966	84	W	SFR	U2	1, 11, 26, 41, 42, 65, 67, 72, 86, 94, 96, 103, 117, 138, 142, 143, 192, 207, 218
		99	N	SFR	R6	
		131	NW	SFR	U1	
	967	492	W	Industrial	U1	1, 41, 42, 65, 67, 72, 86, 94, 96, 103, 117, 138, 142, 143, 207, 218
	968	491	W	Industrial	U1	1, 41, 42, 65, 67, 72, 86, 94, 96, 103, 117, 138, 142, 143, 207, 218
	969	463	W	Industrial	U1	1, 41, 42, 65, 67, 72, 86, 94, 96, 103, 117, 138, 142, 143, 207, 218
	970	97	W	SFR	U1	1, 41, 42, 65, 67, 72, 86, 94, 96, 103, 117, 138, 142, 143, 207, 218
	971	314	SW	SFR	V1	13, 18, 23, 43, 87, 199
	972	156	SW	SFR	V1	13, 18, 23, 43, 87, 199
	973	446	NE	SFR	V1	13, 18, 23, 43, 87, 199
	974	189	S	SFR	U3	1, 3, 5, 10, 11, 14, 15, 16, 19, 24, 25, 26, 28, 36, 41, 42, 44, 54, 58, 61, 63, 65, 67, 70, 72, 78, 86, 94, 96, 103, 108, 117, 119, 137, 138, 142, 143, 146, 170, 186, 187, 191, 192, 200, 207, 217, 218, 219, 221
	975	206	SE	SFR	V3	1, 3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 23, 24, 25, 28, 36, 41, 42, 43, 44, 54, 58, 61, 63, 65, 67, 70, 72, 78, 86, 87, 94, 96, 103, 108, 117, 119, 137, 138, 142, 143, 146, 170, 186, 187, 191, 192, 199, 200, 207, 217, 218, 219, 221
		430	NE	SFR	W5	
		490	ENE	SFR	V1	
		490	ENE	SFR	U3	
	976	319	NE	SFR	W5	1, 3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 23, 24, 25, 28, 36, 41, 42, 43, 44, 54, 58, 61, 63, 65, 67, 70, 72, 78, 86, 87, 94, 96, 103, 108, 117, 119, 137, 138, 142, 143, 146, 170, 186, 187, 191, 192, 199, 200, 207, 217, 218, 219, 221
		367	SE	SFR	V3	
		504	E	SFR	V1	
		504	E	SFR	U3	
	977	307	NE	SFR	W5	41
	978	362	NE	Commercial	W5	41
	979	323	NE	Commercial	W5	41
	980	285	NE	Commercial	W5	41
	981	325	NE	Commercial	W5	41
	982	275	NE	Commercial	W5	41
	983	269	NE	Commercial	W5	41
	984	159	NNW	Commercial	W5	33, 41, 68, 69, 71, 92, 154, 175, 178, 184, 185, 216
		484	WSW	Commercial	W4	
		484	WSW	Commercial	W7	
	985	338	SE	Commercial	W5	41
	986	440	SE	Commercial	W5	41
	987	241	W	SFR	W3	176
	988	409	W	SFR	W3	176
	989	286	W	SFR	W3	176
	990	365	W	SFR	W3	176
	991	59	ENE	Commercial	W4	33, 68, 69, 71, 92, 154, 175, 178, 184, 185, 216
	992	447	ESE	SFR	W1	33, 68, 69, 71, 92, 154, 175, 176, 178, 184, 185, 216
	993	507	N	SFR	V2	22, 29, 116, 130, 132, 164, 179
	994	352	S	SFR	V2	22, 29, 116, 130, 132, 164, 179

Shaded values represent the shortest and longest distance between a habitable structure and a link within a group route subset.

\* Direction represents the distance beginning from the habitable structure towards the provided link.

† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.

Shaded values represent the shortest and longest distance between a habitable structure and a link within a group route subset.

\* Direction represents the distance beginning from the habitable structure towards the provided link.

† To account for photographic interpretation limitations such as shadows, tree canopies, and horizontal accuracy of the photography, Half identified all habitable structures within a measured distance of 520 feet of the alternative route centerline.

# ELECTRONIC INSTALLATIONS WITHIN 2,000 FEET OF THE FILED ALTERNATIVE ROUTES

Facility ID	Installation Type	Licensee	Route	Link	Distance (ft)	Direction to Link
<b>ELECTRONIC INSTALLATIONS WITHIN 2,000 FEET OF A ROUTE</b>						
Tower 1	Unknown	Unknown	1, 3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 22, 23, 24, 25, 26, 28, 29, 33, 36, 41, 42, 43, 44, 54, 58, 61, 63, 65, 67, 68, 69, 70, 71, 72, 78, 86, 87, 199, 200, 207, 216, 221	B2	1,600	South
				B4	830	West
				B5	760	North
				B7	1,440	North
				B8	1,480	Northwest
				C3	1,570	Northwest
Tower 2	Unknown	Uniti Fiber LLC	3, 5, 28, 117, 119, 164	I12	1,795	West
Tower 3	Unknown	Unknown	3, 5, 28, 117, 119, 164	I12	300	Northwest
Tower 4	Unknown	Unknown	10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 43, 44, 58, 61, 63, 70, 78, 87, 199, 200	J22	540	North
Tower 5	Unknown	Unknown	3, 5, 28, 117, 119, 164	I12	955	Northwest
Tower 6	Unknown	Brazos Electric Power Cooperative Inc	3, 5, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 28, 29, 36, 43, 44, 58, 61, 63, 70, 78, 87, 108, 116, 119, 130, 132, 137, 146, 164, 179, 199, 200	M1	1,770	North
Tower 7	Unknown	Unknown	3, 15, 24, 36, 44, 58, 63, 70, 78, 137	M4	1,990	North
Tower 8	Unknown	AMG Technology Investment Group	5, 10, 11, 16, 19, 25, 26, 28, 61, 108, 146, 170, 186, 187, 191, 192, 200	M5	1,995	South
				P1	980	North
Tower 9	Unknown	AirCanopy Internet Services, Inc.	68, 69	Q5	1,260	North

# ELECTRONIC INSTALLATIONS WITHIN 2,000 FEET OF THE FILED ALTERNATIVE ROUTES

Facility ID	Installation Type	Licensee	Route	Link	Distance (ft)	Direction to Link
<b>ELECTRONIC INSTALLATIONS WITHIN 2,000 FEET OF A ROUTE</b>						
Tower 10	Unknown	Millennium Telcom, L.L.C. dba OneSource Communications	33, 68, 69, 71, 92, 154, 175, 176, 178, 184, 185, 216	W3	1,920	West
				W4	955	Southwest
Tower 11	Unknown	Unknown	33, 68, 69, 71, 92, 154, 175, 176, 178, 184, 185, 216	W3	1,630	West
				W4	560	Southwest
Tower 12	Unknown	AMG Technology Investment Group	22, 29, 116, 130, 132, 164, 179	V2	1,745	South
SOURCES: FCC, 2018a; 2018b; 2021; 2022						

# AIRCRAFT LANDING FACILITIES NEAR THE FILED ALTERNATIVE ROUTES

Facility Name	FAA ID	Facility Use	County	Route	Link	Distance (ft)	Direction to Link
<b>FAA REGISTERED AIRPORTS WITH RUNWAY GREATER THAN 3,200 WITHIN 20,000 FEET OF A ROUTE</b>							
Northwest Regional	52F	Open to the public	Denton	All filed routes	A0	12,580	East
					A1	11,775	East
					A3	11,560	East
					A4	12,235	East
					A6	10,710	East
					A7	10,710	East
					B1	11,400	East
					B2	8,905	East
					B4	8,295	East
					B5	8,320	East
					B61	11,400	East
					B62	11,000	East
					B7	8,510	East
					B8	8,320	East
					C1	9,520	East
					C21	7,985	Northeast
					C22	6,580	Northeast
					C23	5,635	Northeast
					C3	4,995	East
					C4	4,995	East
					C5	5,635	Northeast
					C6	3,190	Northeast
					C7	4,255	Northeast
					C8	5,705	Northeast
					C9	4,840	Northeast
					E1	3,190	Northeast
					E2	3,435	Northeast
					E3	4,255	Northeast
					E5	5,705	Northeast
					E6	2,640	North
					E7	3,020	North
					E8	4,090	North
					F1	3,175	North
					F2	3,175	North
					F3	4,110	North
					F4	9,000	North
					F5	3,825	Northwest
					F6	4,225	Northwest
					F7	6,190	North
					F8	8,680	North
					G1	3,825	Northwest
					G2	4,130	Northwest
					G3	4,130	Northwest
					G4	6,190	North
					G5	8,680	North
					G6	9,375	West
					G7	9,975	West
					G8	11,300	Northwest
					H1	8,825	West
					H2	8,830	West
					H3	9,375	West
					H41	9,975	West
					H42	14,350	West
					H5	11,300	Northwest
					H6	13,460	Northwest

# AIRCRAFT LANDING FACILITIES NEAR THE FILED ALTERNATIVE ROUTES

Facility Name	FAA ID	Facility Use	County	Route	Link	Distance (ft)	Direction to Link
<b>FAA REGISTERED AIRPORTS WITH RUNWAY GREATER THAN 3,200 WITHIN 20,000 FEET OF A ROUTE</b>							
Northwest Regional (Continued)	52F	Open to the public	Denton		H8	16,190	West
					H9	16,190	West
					I11	13,670	West
					I12	13,810	West
					I2	13,670	West
					I31	13,845	West
					I32	17,495	West
					I4	17,485	West
					I5	13,760	West
					I6	19,780	West
					I7	19,940	West
					I8	19,780	West
					I9	13,760	West
					J1	19,610	West
					J21	19,610	West
					J4	16,865	West
Fort Worth Alliance	AFW	Open to the public	Denton and Tarrant Counties	3, 5, 10, 11, 13, 14, 15, 16, 18, 19, 22, 23, 24, 25, 26, 28, 29, 33, 36, 41, 42, 43, 44, 54, 58, 61, 63, 70, 71, 78, 86, 87, 92, 94, 103, 108, 116, 117, 119, 130, 132, 137, 138, 146, 154, 164, 170, 175, 176, 178, 179, 184, 185, 186, 187, 199, 200, 207, 216, 217, 218, 219, 221	J5	15,970	Northwest
					J6	15,970	Northwest
					I12	9,475	North
					I31	19,720	Northeast
					I32	18,475	North
					I4	19,720	Northeast
					J21	18,475	North
					J22	13,620	North
					L1	13,620	North
					L2	16,360	Northwest
					L3	16,360	Northwest
					L4	19,590	North
					M1	13,395	Northwest
					M2	12,035	Northwest
					M3	10,970	West
					M4	12,035	Northwest
Fairview	70T	Open to the public	Wise	1, 10, 11, 19, 33, 41, 42, 54, 65, 67, 68, 69, 71, 72, 86, 92, 94, 96, 103, 117, 138, 142, 143, 154, 170, 175, 176, 178, 184, 185, 186, 187, 191, 192, 207, 216, 217, 218, 219, 221	M5	13,395	Northwest
					M6	17,230	Northwest
					M7	19,590	North
					M8	18,365	East
					O2	18,365	East
					O3	17,370	East
					O5	19,355	Southeast
					O6	19,355	Southeast
					O7	15,775	Southeast
					O8	12,180	East
					P1	19,195	South
					P3	16,495	Southeast
					P4	17,640	Southeast
					P5	16,495	Southeast
					P6	14,620	Southeast
					P7	14,620	Southeast
					Q1	12,215	Southeast
					Q2	11,265	Southeast
					Q5	6,395	South
					R1	18,410	South
					S1	15,590	South
					S2	11,425	South
					S3	12,130	South

# AIRCRAFT LANDING FACILITIES NEAR THE FILED ALTERNATIVE ROUTES

Facility Name	FAA ID	Facility Use	County	Route	Link	Distance (ft)	Direction to Link
<b>FAA REGISTERED AIRPORTS WITH RUNWAY GREATER THAN 3,200 WITHIN 20,000 FEET OF A ROUTE</b>							
Fairview (Continued)	70T	Open to the public	Wise		S4	15,405	South
					S5	11,820	South
					T1	6,435	South
					T2	6,435	South
					T3	11,865	South
					T4	15,210	South
					T5	15,150	Southwest
					U1	15,570	South
Kenneth Copeland	4T2	Open to the public	Tarrant	All filed routes	W1	17,510	Southwest
					V2	15,750	Northeast
					V3	17,770	Northeast
					V4	17,325	Northeast
					W3	16,830	Northeast
					W6	16,830	Northeast
					W7	18,660	Northeast
					X	17,770	Northeast
					Z	16,870	Northeast
Facility Name	FAA ID	Facility Use	County	Route	Link	Distance (ft)	Direction to Link
<b>FAA REGISTERED AIRPORTS WITH RUNWAY LESS THAN 3,200 WITHIN 10,000 FEET OF A ROUTE</b>							
Blue Jay Airfield	XA49	Private use	Denton	1, 19, 28, 29, 33, 36, 41, 42, 43, 44, 54, 58, 65, 67, 68, 69, 70, 71, 72, 86, 87, 92, 94, 96, 103, 108, 130, 132, 137, 138, 142, 143, 146, 154, 170, 175, 176, 178, 179, 184, 185, 186, 187, 191, 192, 207, 216, 217, 218, 219, 221,	F4	9,850	East
					F7	9,420	East
					F8	9,420	East
					G3	8,130	South
					G4	5,335	South
					G5	2,255	Southeast
					G6	8,130	South
					G7	5,335	South
					G8	2,255	Southeast
					H41	7,470	South
					H42	7,960	Southwest
					H5	5,215	South
					H6	1,855	South
					H8	8,880	Southwest
					H9	7,225	Southwest
					I9	7,960	Southwest
					J4	7,225	Southwest
					J5	6,590	Southwest
					J6	4,350	Southwest
Dooley	0TS1	Private use	Denton	1, 19, 65, 67, 68, 69, 70, 72, 92, 94, 96, 103, 108, 142, 143, 146, 170, 186, 187, 191, 192, 217, 218, 219	G4	8,925	Southeast
					G5	6,030	Southeast
					G7	8,925	Southeast
					G8	6,030	Southeast
					H5	8,200	South
					H6	4,860	South
					H9	8,630	South
					J4	8,605	South
					J5	8,380	South
Bell Training Facility	3XS7	Private use	Denton	All filed routes	J6	5,170	South
					G2	9,205	East
					G6	9,240	Northeast
					H1	9,240	Northeast
					H2	4,875	Northeast
					H3	5,895	Northeast
					H41	8,150	Northeast
					H42	7,170	Northeast



# AIRCRAFT LANDING FACILITIES NEAR THE FILED ALTERNATIVE ROUTES

Facility Name	FAA ID	Facility Use	County	Route	Link	Distance (ft)	Direction to Link
<b>FAA REGISTERED AIRPORTS WITH RUNWAY LESS THAN 3,200 WITHIN 10,000 FEET OF A ROUTE</b>							
Bell Training Facility (Continued)	3XS7	Private use	Denton		H5	9,495	Northeast
					H8	4,000	North
					H9	7,170	Northeast
					I11	4,235	East
					I12	1,365	Southeast
					I2	4,875	Northeast
					I31	1,455	North
					I32	555	North
					I4	1,455	North
					I5	3,980	North
					I6	3,330	North
					I7	3,330	North
					I8	4,000	North
					I9	5,895	Northeast
					J1	1,990	North
					J21	1,240	Northwest
					J22	1,105	West
					J3	4,900	Northwest
					J4	9,060	North
					J5	9,065	Northeast
					J6	9,495	Northeast
					K1	9,440	Northwest
					K22	9,440	Northwest
Flying S Farm	3TX2	Private use	Denton	1, 19, 29, 33, 36, 41, 42, 54, 65, 67, 68, 69, 71, 72, 86, 92, 94, 96, 103, 108, 116, 130, 132, 137, 138, 142, 143, 146, 154, 170, 175, 176, 178, 179, 184, 185, 186, 187, 191, 192, 207, 216, 217, 218, 219, 221	J3	9,810	Southeast
					J4	8,935	East
					K1	5,445	Southeast
					K21	8,935	East
					K22	9,125	East
					K61	4,340	Southeast
					K62	4,340	Southeast
					L3	7,815	South
					L4	5,140	South
					L5	5,140	South
					M7	7,710	South
					M8	2,430	South
					O2	7,340	West
					O3	7,200	West
					O8	7,320	West
Propwash	16X	Open to the public	Denton	1, 19, 29, 33, 36, 41, 42, 54, 65, 67, 68, 69, 71, 72, 86, 92, 94, 96, 103, 108, 116, 130, 132, 137, 138, 142, 143, 146, 154, 170, 175, 176, 178, 179, 184, 185, 186, 187, 191, 192, 207, 216, 217, 218, 219, 221	K1	7,440	Southeast
					K61	6,835	East
					K62	6,835	East
					L3	8,215	Southeast
					L4	6,000	Southeast
					L5	6,000	Southeast
					M7	7,115	South
					M8	1,935	South
					O1	8,295	Southwest
					O2	4,505	Southwest
					O3	4,330	West
					O7	8,295	Southwest
					O8	4,470	West
					Q2	9,900	West
JW	2TX7	Personal Use	Wise	67, 68, 69	O3	8,850	Southeast
					O8	5,315	South
					Q1	7,050	South

## AIRCRAFT LANDING FACILITIES NEAR THE FILED ALTERNATIVE ROUTES

Facility Name	FAA ID	Facility Use	County	Route	Link	Distance (ft)	Direction to Link
FAA REGISTERED AIRPORTS WITH RUNWAY LESS THAN 3,200 WITHIN 10,000 FEET OF A ROUTE							
JW (Continued)	2TX7	Personal Use	Wise		Q2	5,075	South
					Q5	7,015	South
Facility Name	FAA ID	Facility Use	County	Route	Link	Distance (ft)	Direction to Link
HELIPORTS WITHIN 5,000 FEET OF A ROUTE							
Texas Motor Speedway	-	-	Denton	3, 5, 10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 28, 61, 63, 78, 117, 119, 164, 199, 200	H2	4,965	East
					I11	3,865	East
					I12	2,065	Southeast
					I2	4,965	East
					I31	3,855	East
Bell Training Facility	3XS7	Private Use	Denton	3, 5, 10, 11, 13, 14, 15, 16, 18, 22, 23, 24, 25, 26, 28, 29, 33, 36, 41, 42, 43, 44, 54, 58, 61, 63, 70, 71, 78, 86, 87, 116, 117, 119, 130, 132, 137, 138, 154, 164, 175, 176, 178, 179, 184, 185, 186, 187, 199, 200, 207, 216, 217, 218, 221	H2	4,875	Northeast
					H8	4,000	North
					I11	4,235	East
					I12	1,365	Southeast
					I2	4,875	Northeast
					I31	1,455	North
					I32	555	North
					I4	1,455	North
					I5	3,980	North
					I6	3,330	North
					I7	3,330	North
					I8	4,000	North
					J1	1,990	North
					J21	1,240	Northwest
					J22	1,105	West
Rolling V Ranch	3TE7	Private use	Wise	All filed routes	J3	4,900	Northwest
					V2	4,510	Northwest
					V3	4,915	Northwest
					V4	4,510	Northwest
					W3	750	North
					W4	3,365	Northeast
					W5	4,650	East
					W6	2,030	Southeast
					W7	4,080	Northwest
X	4,080	Southeast					
Z	4,145	Northwest					
SOURCES: AirNav, 2023; FAA, 2023; TxDOT, 2022c; USGS, 1955-1992							

**NOTES:**

- Identification code assigned to facilities registered with the FAA.
- Shaded links indicate those links that may exceed the horizontal slope, assuming a maximum tower height of 175 feet.

***Application of Oncor Electric Delivery Company LLC to Amend its Certificate of Convenience and Necessity for the Ramhorn Hill Switch – Dunham Switch 345 kV Transmission Line in Denton and Wise Counties, Texas***

**PUBLIC UTILITY COMMISSION OF TEXAS DOCKET NO. 55067**

*Landowner*

This notice is provided to notify you that Oncor Electric Delivery Company LLC (“Oncor”) has applied to amend its certificate of convenience and necessity to construct, own, and operate a new double-circuit 345 kV transmission line on triple-circuit capable structures between the proposed Ramhorn Hill Switch and the proposed Dunham Switch. The structures will have two 345 kV circuits initially installed with a vacant third circuit position capable of accommodating a future 138 kV circuit.

The proposed Ramhorn Hill Switch will be located approximately 2 miles south of the intersection of United States Highway (“US”) 287 and State Highway (“SH”) 114 near Rhome, Texas. The proposed Dunham Switch will be located approximately 1.4 miles southeast of the intersection of US 377 and Farm-to-Market Road (“FM”) 1171 (regionally known as Cross Timbers Road) in Flower Mound, Texas. The length of the Proposed Transmission Line Project is approximately 20 to 23 miles, depending on which route is selected by the Public Utility Commission of Texas (“PUC”).

Your land may be directly affected by this docket. If the applicant’s route is approved by the PUC, the applicant will have the right to build a facility that may directly affect your land. This docket will not determine the value of your land or the value of an easement if one is needed by the applicant to build the facility. If you have questions about this project, please contact Chris Reily of Oncor at (214) 486-4717.

A detailed routing map may be reviewed at the following locations:

Display Location	Address
Rhome City Hall	501 South Main Street Rhome, TX 76078
Flower Mound Town Hall	2121 Cross Timbers Road Flower Mound, TX 75028

***All routes and route segments included in this notice are available for selection and approval by the Public Utility Commission of Texas.***

The enclosed brochure entitled “Landowners and Transmission Line Cases at the PUC” provides basic information about how you may participate in this docket, and how you may contact the PUC. Please read this brochure carefully. The brochure includes sample forms for making comments and for making a request to intervene as a party in this docket. ***The only way to fully participate in the PUC’s decision on where to locate the transmission line is to intervene in the docket. It is important for an affected person to intervene because the utility is not obligated to***

***keep affected persons informed of the PUC's proceedings and cannot predict which route may or may not be approved by the PUC.***

In addition to the contacts listed in the brochure, you may call the PUC's Customer Assistance Hotline at (888) 782-8477. Hearing- and speech-impaired individuals with text telephones (TTY) may contact the PUC's Customer Assistance Hotline at (512) 936-7136 or toll free at (800) 735-2989. If you wish to participate in this proceeding by becoming an intervenor, the deadline for intervention in the proceeding is **July 24, 2023**, which is 46 days after the filing of the application. The PUC must receive a letter from you requesting intervention by that date if you choose to intervene. The request to intervene form is included with your brochure.

The preferred method for you to file your request for intervention is electronically. If you decide to file a request for intervention, you will be required to serve the request on all other parties by email. Therefore, please include your own email address on the intervention form. Instructions for electronic filing via the "PUC Filer" on the PUC's website can be found here: <https://interchange.puc.texas.gov/filer>. Instructions for using the PUC Filer are available at [https://ftp.puc.texas.gov/public/puct-info/industry/filings/E-Filing\\_Instructions.pdf](https://ftp.puc.texas.gov/public/puct-info/industry/filings/E-Filing_Instructions.pdf). For assistance with your electronic filing, please contact the PUC's Help Desk at (512) 936-7100 or [helpdesk@puc.texas.gov](mailto:helpdesk@puc.texas.gov). You can review materials filed in this docket on the PUC Interchange at: <http://interchange.puc.texas.gov>.

While the preferred method for submitting a request for intervention is electronically, you may file your request for intervention by mailing a hard copy of your request to the PUC. Any request must be received by the intervention deadline of **July 24, 2023**. If you are not filing your request for intervention electronically, the PUC's rules require you to mail the request for intervention and 10 copies of the request to:

Public Utility Commission of Texas  
Central Records  
Attn: Filing Clerk  
1701 N. Congress Avenue  
P.O. Box 13326  
Austin, Texas 78711-3326

Persons who wish to intervene in the docket must also email or mail a copy of their request for intervention to all parties in the docket and all persons who have pending motions to intervene, at or before the time the request for intervention is electronically filed with, or mailed to, the PUC. In addition to the intervention deadline, other important deadlines may exist that affect your participation in this docket. You should review the orders and other filings made in the docket. The enclosed brochure explains how you can access these filings.

Enclosures:

- Route Composition, Route Description, and Maps
- Brochure: Landowners & Transmission Line Cases at the PUC
- Request to Intervene Form
- Comment Form
- The State of Texas Landowner's Bill of Rights

The following files are not convertible:

Att. 12b Composition of Routes.xlsx

Please see the ZIP file for this Filing on the PUC Interchange in order to access these files.

Contact [centralrecords@puc.texas.gov](mailto:centralrecords@puc.texas.gov) if you have any questions.

#### Link A0

**Link A0** begins at the proposed Dunham Switch and proceeds in a northerly direction approximately 400 feet to the intersection of **Links A0, A1, and A4**.

#### Link A1

From the intersection of **Links A0, A1, and A4**, Link A1 proceeds in a northwesterly direction approximately 840 feet to the intersection of **Links A1 and A3**. Link A1 crosses Haynes Road.

#### Link A3

From the intersection of **Links A1 and A3**, Link A3 proceeds in a westerly direction approximately 220 feet to the intersection of **Links A3 and A6**.

#### Link A4

From the intersection of **Links A0, A1, and A4**, Link A4 proceeds in a northerly direction approximately 2,290 feet to the intersection of **Links A4, A7, and B1**.

#### Link A6

From the intersection of **Links A3 and A6**, Link A6 proceeds in a westerly direction approximately 500 feet to an angle point. From this angle point, Link A6 proceeds in a northerly direction approximately 1,000 feet to a slight angle point. From this angle point, Link A6 proceeds in a northerly direction approximately 880 feet to the intersection of **Links A6, A7, and B2**.

#### Link A7

From the intersection of **Links A4, A7, and B1**, Link A7 proceeds in a westerly direction parallel to the south side of Dunham Road approximately 1,530 feet to the intersection of **Links A6, A7, and B2**. Link A7 crosses Haynes Road.

#### Link B1

From the intersection of **Links A4, A7, and B1**, Link B1 proceeds in a northerly direction approximately 1,220 feet to an angle point. This segment of Link B1 crosses Dunham Road. From this angle point, Link B1 proceeds in a northwesterly direction approximately 1,850 feet to the intersection of **Links B1, B5, and B61**. This segment of Link B1 crosses an existing transmission line.

#### Link B2

From the intersection of **Links A6, A7, and B2**, Link B2 proceeds in a northerly direction approximately 1,050 feet to an angle point. This segment of Link B2 crosses Dunham Road. From this angle point, Link B2 proceeds in a westerly direction approximately 1,210 feet to a slight angle point. From this angle point, Link B2 proceeds in a northwesterly direction approximately 570 feet to the intersection of **Links B2 and B4**. This segment of Link B2 crosses Dunham Road.

#### Link B4

From the intersection of **Links B2 and B4**, Link B4 proceeds in a northwesterly direction approximately 580 feet to an angle point. This segment of Link B4 crosses an existing transmission line and an unnamed stream. From this angle point, Link B4 proceeds in a northwesterly direction approximately 450 feet. This segment of Link B4 crosses US 377. From this angle point, Link B4 proceeds in a northerly direction approximately 2,070 to the intersection of **Links B4, B5, and B8**.

#### Link B5

From the intersection of **Links B1, B5, and B61**, Link B5 proceeds in a northwesterly direction parallel to the south side of FM 1171 approximately 2,840 feet to a slight angle point. This segment of Link B5 crosses US 377. From this angle point, Link B5 proceeds in a northwesterly direction parallel to the south side of FM 1171 approximately 470 feet to the intersection of **Links B4, B5, and B8**.

#### Link B61

From the intersection of **Links B1, B5, and B61**, Link B61 proceeds in a northeasterly direction approximately 790 feet to the intersection of **Links B61 and B62**. Link B61 crosses FM 1171.

#### Link B62

From the intersection of **Links B61 and B62**, Link B62 proceeds in a northwesterly direction parallel to the south side of an existing transmission line approximately 800 feet to the intersection of **Links B62, B7, and C1**.

#### Link B7

From the intersection of **Links B62, B7, and C1**, Link B7 proceeds in a westerly direction approximately 2,490 feet to the intersection of **Links B7, B8, and C3**. Link B7 crosses US 377.

#### Link B8

From the intersection of **Links B4, B5, and B8**, Link B8 proceeds in a northeasterly direction approximately 280 feet to the intersection of **Links B7, B8, and C3**. Link B8 crosses FM 1171.

#### Link C1

From the intersection of **Links B62, B7, and C1**, Link C1 proceeds in a northwesterly direction parallel to the south side of an existing transmission line approximately 2,080 feet to the intersection of **Links C1 and C21**.

#### Link C21

From the intersection of **Links C1 and C21**, Link C21 proceeds in a westerly direction approximately 310 feet to an angle point. This segment of Link C21 crosses US 377. From this angle point, Link C21 proceeds in a northerly direction parallel to the west side of US 377 approximately 280 feet to an angle point. From this angle point, Link C21 proceeds in a northwesterly direction parallel to the south side of an existing transmission line approximately 2,340 feet to the intersection of **Links C21, C22, and C23**. This segment of Link C21 crosses a railroad and a natural gas pipeline.

#### Link C22

From the intersection of **Links C21, C22, and C23**, Link C22 proceeds in a northwesterly direction parallel to the south side of an existing transmission line approximately 1,920 feet to an angle point. From this angle point, Link C22 proceeds in a westerly direction approximately 720 feet to an angle point. From this angle point, Link C22 proceeds in a northwesterly direction approximately 540 feet to the intersection of **Links C22, C5, and C8**. This segment of Link C22 crosses an unnamed stream, a natural gas pipeline, and Canyon Falls Drive.

#### Link C23

From the intersection of **Links C21, C22, and C23**, Link C23 proceeds in a westerly direction approximately 2,650 feet to the intersection of **Links C23, C4, C5, and C7**.

#### **Link C3**

From the intersection of **Links B7, B8, and C3**, Link C3 proceeds in a northwesterly direction parallel to the north side of FM 1171 approximately 1,150 feet to an angle point. From this angle point, Link C3 proceeds in a northwesterly direction approximately 3,100 feet to the intersection of **Links C3, C4, and C6**. This segment of Link C3 crosses a railroad and a natural gas pipeline.

#### **Link C4 (bi-directional)**

From the intersection of **Links C3, C4, and C6**, Link C4 proceeds in a northerly direction approximately 1,440 feet to the intersection of **Links C23, C4, C5 and C7**.

#### **Link C5**

From the intersection of **Links C23, C4, C5 and C7**, Link C5 proceeds in a northerly direction approximately 1,500 feet to the intersection of **Links C22, C5 and C8**. Link C5 crosses an unnamed stream, a natural gas pipeline, and Canyon Falls Drive.

#### **Link C6**

From the intersection of **Links C3, C4, and C6**, Link C6 proceeds in a southwesterly direction approximately 370 feet to an angle point. This segment of Link C6 crosses a natural gas pipeline and FM 1171. From this angle point, Link C6 proceeds in a northwesterly direction approximately 1,230 feet to a slight angle point. This segment of Link C6 crosses two natural gas pipelines and Graham Branch. From this angle point, Link C6 proceeds in a northwesterly direction approximately 490 feet to a slight angle point. From this angle point, Link C6 proceeds in a northwesterly direction approximately 540 feet to the intersection of **Links C6, E1, and E6**.

#### **Link C7**

From the intersection of **Links C23, C4, C5 and C7**, Link C7 proceeds in a westerly direction approximately 970 feet to an angle point. This segment of Link C7 crosses a natural gas pipeline and Canyon Falls Drive. From this angle point, Link C7 proceeds in a northwesterly direction approximately 640 feet. This segment of Link C7 crosses an unnamed stream. From this angle point, Link C7 proceeds in a westerly direction approximately 630 feet to the intersection of **Links C7, E2, and E3**. This segment of Link C7 crosses Graham Branch.

#### **Link C8**

From the intersection of **Links C22, C5, and C8**, Link C8 proceeds in a westerly direction approximately 1,350 feet to the intersection of **Links C8, C9, and E5**. Link C8 crosses Graham Branch.

#### **Link C9 (bi-directional)**

From the intersection of **Links C8, C9, and E5**, Link C9 proceeds in a southwesterly direction approximately 870 feet to an angle point. This segment of Link C9 crosses Westbridge Drive. From this angle point, Link C9 proceeds in a southerly direction approximately 170 feet to the intersection of **Links C9, E3, and E8**.

#### **Link E1 (bi-directional)**

From the intersection of **Links C6, E1, and E6**, Link E1 proceeds in a northeasterly direction approximately 280 feet to the intersection of **Links E1, E2, and E7**. Link E1 crosses FM 1171.



**Link E2 (bi-directional)**

From the intersection of **Links E1, E2, and E7**, Link E2 proceeds in a northerly direction approximately 1,110 feet to the intersection of **Links E2, E3, and C7**.

**Link E3**

From the intersection of **Links C7, E2, and E3**, Link E3 proceeds in a northerly direction approximately 710 feet to the intersection of **Links C9, E3, and E8**.

**Link E5**

From the intersection of **Links C8, C9, and E5**, Link E5 proceeds in a northwesterly direction approximately 2,480 feet to an angle point. This segment of Link E5 crosses an unnamed stream. From this angle point, Link E5 proceeds in a northerly direction approximately 940 feet to an angle point. This segment of Link E5 crosses Graham Branch twice and a natural gas pipeline. From this angle point, Link E5 proceeds in a northwesterly direction approximately 1,030 feet to the intersection of **Links E5 and F4**.

**Link E6**

From the intersection of **Links C6, E1, and E6**, Link E6 proceeds in a northwesterly direction parallel to the south side of FM 1171 approximately 2,030 feet to an angle point. This segment of Link E6 crosses an unnamed stream. From this angle point, Link E6 proceeds in a westerly direction approximately 3,450 feet to the intersection of **Links E6, F5, and G1**. This segment of Link E6 crosses a natural gas pipeline, Cleveland Gibbs Road, and Cleveland Branch.

**Link E7**

From the intersection of **Links E1, E2, and E7**, Link E7 proceeds in a northwesterly direction parallel to the north side of FM 1171 approximately 2,690 feet to an angle point. This segment of Link E7 crosses an unnamed stream and a natural gas pipeline. From this angle point, Link E7 proceeds in a westerly direction parallel to the north side of FM 1171 approximately 420 feet to the intersection of **Links E7, F1, and F2**. This segment of Link E7 crosses Cleveland Gibbs Road.

**Link E8**

From the intersection of **Links C9, E3, and E8**, Link E8 proceeds in a westerly direction approximately 2,970 feet to the intersection of **Links E8, F2, and F3**. Link E8 crosses a natural gas pipeline twice, an unnamed stream, and Cleveland Gibbs Road.

**Link F1**

From the intersection of **Links E7, F1, and F2**, Link F1 proceeds in a westerly direction parallel to the north side of FM 1171 approximately 530 feet to a slight angle point. From this angle point, Link F1 proceeds in a westerly direction parallel to the north side of FM 1171 approximately 1,980 feet to the intersection of **Links F1, F5, and F6**. This segment of Link F1 crosses Cleveland Branch.

**Link F2 (bi-directional)**

From the intersection of **Links E7, F1, and F2**, Link F2 proceeds in a northerly direction parallel to the west side of Cleveland Gibbs Road approximately 940 feet to the intersection of **Links E8, F2, and F3**.

**Link F3**

From the intersection of **Links E8, F2, and F3**, Link F3 proceeds in a northerly direction parallel to the west side of Cleveland Gibbs Road approximately 840 feet to an angle point. From this

angle point, Link F3 proceeds in a northwesterly direction approximately 1,400 feet to a slight angle point. From this angle point, Link F3 proceeds in a northwesterly direction approximately 440 feet to the intersection of **Links F3, F6, F7, and G4**.

#### **Link F4**

From the intersection of **Links E5 and F4**, Link F4 proceeds in a westerly direction approximately 2,660 feet to an angle point. From this angle point, Link F4 proceeds in a northwesterly direction approximately 1,010 feet to the intersection of **Links F4 and F8**. This segment of Link F4 crosses IH 35W.

#### **Link F5 (bi-directional)**

From the intersection of **Links E6, F5, and G1**, Link F5 proceeds in a northerly direction approximately 580 feet to the intersection of **Links F1, F5, and F6**. Link F5 crosses FM 1171.

#### **Link F6**

From the intersection of **Links F1, F5, and F6**, Link F6 proceeds in a northerly direction approximately 660 feet to an angle point. From this angle point, Link F6 proceeds in a northeasterly direction parallel to the east side of IH 35W approximately 2,310 feet to the intersection of **Links F3, F6, F7 and G4**. This segment of Link F6 crosses Cleveland Branch.

#### **Link F7**

From the intersection of **Links F3, F6, F7 and G4**, Link F7 proceeds in a northeasterly direction parallel to the east side of IH 35W approximately 1,710 feet to an angle point. From this angle point, Link F7 proceeds in a northwesterly direction approximately 490 feet to an angle point. This segment of Link F7 crosses IH 35W. From this angle point, Link F7 proceeds in a northerly direction approximately 900 feet to the intersection of **Links F7, F8 and G5**. This segment of Link F7 crosses a natural gas pipeline.

#### **Link F8**

From the intersection of **Links F4 and F8**, Link F8 proceeds in a southwesterly direction approximately 480 feet to a slight angle point. This segment of Link F8 crosses Cleveland Gibbs Road. From this angle point, Link F8 proceeds in a southwesterly direction approximately 680 feet to the intersection of **Links F8, F7, and G5**.

#### **Link G1**

From the intersection of **Links E6, F5 and G1**, Link G1 proceeds in a southwesterly direction approximately 660 feet to an angle point. From this angle point, Link G1 proceeds in a southwesterly direction parallel to the east side of IH 35W approximately 620 feet to the intersection of **Links G1, G2, and G3**.

#### **Link G2**

From the intersection of **Links G1, G2, and G3**, Link G2 proceeds in a southwesterly direction parallel to the east side of IH 35W approximately 1,430 feet to a slight angle point. From this angle point, Link G2 proceeds in a southwesterly direction parallel to the east side of IH 35W approximately 1,470 feet to a slight angle point. This segment of Link G2 crosses a natural gas pipeline. From this angle point, Link G2 proceeds in a southwesterly direction parallel to the east side of IH 35W approximately 1,250 feet to an angle point. This segment of Link G2 crosses Denton Creek. From this angle point, Link G2 proceeds in a northwesterly direction approximately 530 feet to an angle point. This segment of Link G2 crosses a natural gas pipeline and IH 35W. From this angle point, Link G2 proceeds in a westerly direction approximately 660 feet to an angle point. This segment of Link G2 crosses an unnamed

stream. From this angle point, Link G2 proceeds in a northwesterly direction approximately 1,150 feet to an angle point. This segment of Link G2 crosses an unnamed stream. From this angle point, Link G2 proceeds in a westerly direction approximately 1,420 feet to an angle point. This segment of Link G2 crosses a natural gas pipeline and an unnamed stream. From this angle point, Link G2 proceeds in a northerly direction approximately 520 feet to the intersection of **Links G2, H1, and H2**.

#### **Link G3**

From the intersection of **Links G1, G2, and G3**, Link G3 proceeds in a northwesterly direction approximately 4,850 feet to an angle point. This segment of Link G3 crosses IH 35W and the access ramps, two unnamed streams (one of which it crosses twice), and a natural gas pipeline. From this angle point, Link G3 proceeds in a westerly direction approximately 1,080 feet to the intersection of **Links G3, G6, G7 and H41**. This segment of Link G3 crosses an unnamed stream.

#### **Link G4**

From the intersection of **Links F3, F6, F7 and G4**, Link G4 proceeds in a northwesterly direction approximately 500 feet to an angle point. This segment of Link G4 crosses IH 35W and Cleveland Branch. From this angle point, Link G4 proceeds in a westerly direction approximately 3,400 feet to an angle point. This segment of Link G4 crosses two unnamed streams. From this angle point, Link G4 proceeds in a northwesterly direction approximately 1,000 feet to an angle point. From this angle point, Link G4 proceeds in a westerly direction approximately 2,580 feet to the intersection of **Links G4, G7, G8 and H5**. This segment of Link G4 crosses two natural gas pipelines.

#### **Link G5**

From the intersection of **Links F7, F8, and G5**, Link G5 proceeds in a northwesterly direction approximately 3,830 feet to an angle point. This segment of Link G5 crosses an unnamed stream. From this angle point, Link G5 proceeds in a westerly direction approximately 1,530 feet to an angle point. This segment of Link G5 crosses an unnamed stream. From this angle point, Link G5 proceeds in a southwesterly direction approximately 520 feet to an angle point. From this angle point, Link G5 proceeds in a westerly direction approximately 2,240 feet to the intersection of **Links G5, G8, and H6**. This segment of Link G5 crosses two natural gas pipelines.

#### **Link G6 (bi-directional)**

From the intersection of **Links G3, G6, G7 and H41**, Link G6 proceeds in a southerly direction approximately 2,640 feet to the intersection of **Links G6, H1, and H3**. Link G6 crosses an unnamed stream and Denton Creek.

#### **Link G7 (bi-directional)**

From the intersection of **Links G4, G7, G8 and H5**, Link G7 proceeds in a southerly direction approximately 2,850 feet to the intersection of **Links G3, G6, G7 and H41**. Link G7 crosses 3 natural gas pipelines and an unnamed stream twice.

#### **Link G8 (bi-directional)**

From the intersection of **Links G5, G8 and H6**, Link G8 proceeds in a southerly direction approximately 3,330 feet to the intersection of **Links G4, G7, G8 and H5**.

#### Link H1

From the intersection of **Links G2, H1 and H2**, Link H1 proceeds in a northerly direction approximately 1,100 feet to an angle point. From this angle point, Link H1 proceeds in a westerly direction approximately 520 feet to the intersection of **Links G6, H1, and H3**.

#### Link H2

From the intersection of **Links G2, H1 and H2**, Link H2 proceeds in a westerly direction approximately 4,840 feet to the intersection of **Links H2, I11, and I2**. Link H2 crosses three natural gas pipelines and Bob Phinney Drive.

#### Link H3

From the intersection of **Links G6, H1, and H3**, Link H3 proceeds in a westerly direction approximately 1,140 feet to an angle point. From this angle point, Link H3 proceeds in a northerly direction approximately 510 feet to an angle point. From this angle point, Link H3 proceeds in a westerly direction approximately 3,220 feet to the intersection of **Links H3, I2, and I9**. This segment of Link H3 crosses an unnamed stream and two natural gas pipelines.

#### Link H41

From the intersection of **Links G3, G6, G7 and H41**, Link H41 proceeds in a westerly direction approximately 2,060 feet to an angle point. This segment of Link H41 crosses three natural gas pipelines and an unnamed stream. From this angle point, Link H41 proceeds in a northwesterly direction approximately 950 feet to an angle point. From this angle point, Link H41 proceeds in a westerly direction approximately 1,670 feet to the intersection of **Links H41, H42, and I9**. This segment of Link H41 crosses Denton Creek.

#### Link H42

From the intersection of **Links H41, H42, and I9**, Link H42 proceeds in a westerly direction approximately 1,910 feet to the intersection of **Links H42, H8, and H9**.

#### Link H5

From the intersection of **Links G4, G7, G8 and H5**, Link H5 proceeds in a westerly direction approximately 5,330 feet to the intersection of **Links H5, J5, and J6**. Link H5 crosses five natural gas pipelines, Denton Creek, and an unnamed stream.

#### Link H6

From the intersection of **Links G5, G8 and H6**, Link H6 proceeds in a westerly direction approximately 5,330 feet to the intersection of **Links H6 and J6**. Link H6 crosses five natural gas pipelines, Denton Creek, and three unnamed streams.

#### Link H8

From the intersection of **Links H42, H8, and H9**, Link H8 proceeds in a southwesterly direction approximately 350 feet to an angle point. This segment of Link H8 crosses two natural gas pipelines. From this angle point, Link H8 proceeds in a westerly direction approximately 3,040 feet to an angle point. This segment of Link H8 crosses an unnamed stream three times and two natural gas pipelines. From this angle point, Link H8 proceeds in a southwesterly direction, generally parallel to the east side of a railroad approximately 2,220 feet to the intersection of **Links H8, I5, I6, and I8**. This segment of Link H8 crosses two natural gas pipelines and Harmonson Road.

#### **Link H9 (bi-directional)**

From the intersection of **Links H42, H8, and H9**, Link H9 proceeds in a northerly direction approximately 2,120 feet to the intersection of **Links H9, J4, and J5**. Link H9 crosses an unnamed stream and two natural gas pipelines.

#### **Link I11**

From the intersection of **Links H2, I11, and I2**, Link I11 proceeds in a southerly direction approximately 500 feet to an angle point. From this angle point, Link I11 proceeds in a southwesterly direction approximately 620 feet to the intersection of **Links I11, I12, and I31**. This segment of Link I11 crosses a natural gas pipeline and Harmonson Road.

#### **Link I12**

From the intersection of **Links I11, I12, and I31**, Link I12 proceeds in a southerly direction approximately 1,360 feet to an angle point. This segment of Link I12 crosses a natural gas pipeline. From this angle point, Link I12 proceeds in a southwesterly direction generally parallel to the north side of Victory Circle approximately 7,260 feet to an angle point. This segment of Link I12 crosses four natural gas pipelines, Catherine Branch, and a refined liquid product pipeline. From this angle point, Link I12 proceeds in a southerly direction approximately 1,000 feet to an angle point. This segment of Link I12 crosses Doc Mitchell Road. From this angle point, Link I12 proceeds in a westerly direction approximately 1,760 feet to an angle point. This segment of Link I12 crosses a natural gas pipeline. From this angle point, Link I12 proceeds in a northwesterly direction approximately 520 feet to an angle point. From this angle point, Link I12 proceeds in a southwesterly direction approximately 860 feet to an angle point. From this angle point, Link I12 proceeds in a westerly direction approximately 430 feet to an angle point. This segment of Link I12 crosses a natural gas pipeline, a railroad, and FM 156. From this angle point, Link I12 proceeds in a southwesterly direction parallel to the west side of FM 156 approximately 1,450 feet to an angle point. This segment of Link I12 crosses Martin Ranch Road. From this angle point, Link I12 proceeds in a southwesterly direction approximately 1,010 feet to an angle point. From this angle point, Link I12 proceeds in a northwesterly direction approximately 2,860 feet to an angle point. This segment of Link I12 crosses Harriet Creek and two natural gas pipelines. From this angle point, Link I12 proceeds in a northwesterly direction approximately 770 feet to a slight angle point. This segment of Link I12 crosses Harriet Creek Drive. From this angle point, Link I12 proceeds in a northwesterly direction approximately 890 feet to a slight angle point. From this angle point, Link I12 proceeds in a northwesterly direction approximately 1,040 feet to an angle point. From this angle point, Link I12 proceeds in a northwesterly direction approximately 1,840 feet to an angle point. This segment of Link I12 crosses Harriet Creek twice and unnamed stream. From this angle point, Link I12 proceeds in a northwesterly direction approximately 350 feet to the intersection of **Links I12, J22, and L1**. This segment of Link I12 crosses Harriet Creek.

#### **Link I2 (bi-directional)**

From the intersection of **Links H2, I11, and I2**, Link I2 proceeds in a northerly direction approximately 1,630 feet to the intersection of **Links H3, I2, I5, and I9**.

#### **Link I31**

From the intersection of **Links I11, I12, and I31**, Link I31 proceeds in a westerly direction parallel to the south side of a Harmonson Road approximately 1,220 feet to an angle point. This segment of Link I31 crosses a natural gas pipeline. From this angle point, Link I31 proceeds in a southwesterly direction approximately 520 feet to an angle point. From this angle point, Link I31 proceeds in a westerly direction approximately 1,930 feet to the intersection of **Links I31, I32, and I4**.

#### **Link I32**

From the intersection of **Links I31, I32, and I4**, Link I32 proceeds in a westerly direction approximately 2,900 feet to the intersection of **Links I32, J21, and J22**. Link I32 crosses an unnamed stream and Catherine Branch.

#### **Link I4**

From the intersection of **Links I31, I32, and I4**, Link I4 proceeds in a northerly direction approximately 1,440 feet to an angle point. From this angle point, Link I4 proceeds in a westerly direction approximately 2,120 feet to the intersection of **Links I4, J1, and J21**. This segment of Link I4 crosses an unnamed stream.

#### **Link I5**

From the intersection of **Links H3, I2, I5, and I9**, Link I5 proceeds in a southwesterly direction approximately 1,240 feet to an angle point. This segment of Link I5 crosses two natural gas pipelines. From this angle point, Link I5 proceeds in a northwesterly direction approximately 530 feet to an angle point. This segment of Link I5 crosses a natural gas pipeline. From this angle point, Link I5 proceeds in a westerly direction approximately 1,960 feet to an angle point. This segment of Link I5 crosses an unnamed stream. From this angle point, Link I5 proceeds in a northwesterly direction approximately 630 feet to an angle point. This segment of Link I5 crosses Harmonson Road. From this angle point, Link I5 proceeds in a westerly direction approximately 2,190 feet to the intersection of **Links H8, I5, I6, and I8**.

#### **Link I6 (bi-directional)**

From the intersection of **Links H8, I5, I6, and I8**, Link I6 proceeds in a southwesterly direction parallel to the east side of a railroad approximately 740 feet to the intersection of **Links I6, I7, and J1**.

#### **Link I7**

From the intersection of **Links I6, I7, and J1**, Link I7 proceeds in a northwesterly direction approximately 450 feet to an angle point. This segment of Link I7 crosses a railroad and FM 156. From this angle point, Link I7 proceeds in a westerly direction approximately 1,630 feet to an angle point. This segment of Link I7 crosses an unnamed stream. From this angle point, Link I7 proceeds in a northerly direction approximately 680 feet to the intersection of **Links I7, I8, and J3**.

#### **Link I8**

From the intersection of **Links H8, I5, I6, and I8**, Link I8 proceeds in a northwesterly direction approximately 440 feet to an angle point. This segment of Link I8 crosses a railroad and FM 156. From this angle point, Link I8 proceeds in a westerly direction approximately 1,870 feet to the intersection of **Links I7, I8, and J3**. This segment of Link I8 crosses an unnamed stream.

#### **Link I9 (bi-directional)**

From the intersection of **Links H3, I2, I5, and I9**, Link I9 proceeds in a northerly direction approximately 2,820 feet to the intersection of **Links H41, H42, and I9**. Link I9 crosses an unnamed stream and a natural gas pipeline.

#### **Link J1 (bi-directional)**

From the intersection of **Links I6, I7, and J1**, Link J1 proceeds in a southeasterly direction approximately 1,340 feet to the intersection of **Links I4, J1, and J21**. Link J1 crosses an unnamed stream twice.

#### **Link J21**

From the intersection of **Links I4, J1, and J21**, Link J21 proceeds in a southwesterly direction approximately 1,600 feet to the intersection of **Links I32, J21, and J22**. Link J21 crosses Catherine Branch.

#### **Link J22**

From the intersection of **Links I32, J21, and J22**, Link J22 proceeds in a southerly direction approximately 1,000 feet to an angle point. This segment of Link J22 crosses a natural gas pipeline. From this angle point, Link J22 proceeds in a southwesterly direction approximately 980 feet to an angle point. From this angle point, Link J22 proceeds in a northwesterly direction approximately 1,040 feet to an angle point. This segment of Link J22 crosses four natural gas pipelines, a railroad, and FM 156. From this angle point, Link J22 proceeds in a westerly direction approximately 1,520 feet to an angle point. This segment of Link J22 crosses a refined liquid product pipeline. From this angle point, Link J22 proceeds in a southwesterly direction approximately 1,000 feet to an angle point. From this angle point, Link J22 proceeds in a westerly direction approximately 1,440 feet to an angle point. This segment of Link J22 crosses two natural gas pipelines. From this angle point, Link J22 proceeds in a northerly direction approximately 530 feet to an angle point. This segment of Link J22 crosses a natural gas pipeline and a railroad. From this angle point, Link J22 proceeds in a westerly direction parallel to the north side of a railroad approximately 610 feet to a slight angle point. From this angle point, Link J22 proceeds in a southwesterly direction parallel to the north side of a railroad approximately 540 feet to a slight angle point. From this angle point, Link J22 proceeds in a southwesterly direction parallel to the north side of a railroad approximately 730 feet to a slight angle point. From this angle point, Link J22 proceeds in a southwesterly direction parallel to the north side of a railroad approximately 450 feet to a slight angle point. From this angle point, Link J22 proceeds in a southwesterly direction parallel to the north side of a railroad approximately 650 feet to an angle point. From this angle point, Link J22 proceeds in a southeasterly direction approximately 380 feet to an angle point. This segment of Link J22 crosses a railroad and a natural gas pipeline. From this angle point, Link J22 proceeds in a southwesterly direction parallel to the south side of a railroad approximately 690 feet to a slight angle point. This segment of Link J22 crosses a natural gas pipeline. From this angle point, Link J22 proceeds in a southwesterly direction approximately 1,840 feet to the intersection of **Links I12, J22, and L1**. This segment of Link J22 crosses an unnamed stream.

#### **Link J3**

From the intersection of **Links I7, I8, and J3**, Link J3 proceeds in a northerly direction approximately 1,000 feet to an angle point. This segment of Link J3 crosses an unnamed stream. From this angle point, the Link J3 proceeds in a westerly direction approximately 730 feet to an angle point. This segment of Link J3 crosses two natural gas pipelines and an unnamed stream. From this angle point, Link J3 proceeds in a northerly direction approximately 450 feet to an angle point. This segment of Link J3 crosses an unnamed stream. From this angle point, Link J3 proceeds in a westerly direction approximately 4,250 feet to the intersection of **Links J3, K1, and K22**. This segment of Link J3 crosses Boss Range Road and two natural gas pipelines.

#### **Link J4**

From the intersection of **Links H9, J4, and J5**, Link J4 proceeds in a northwesterly direction approximately 3,310 feet to an angle point. This segment of Link J4 crosses a natural gas pipeline. From this angle point, Link J4 proceeds in a southwesterly direction approximately 730 feet to an angle point. From this angle point, Link J4 proceeds in a westerly direction approximately 1,260 feet to an angle point. This segment of Link J4 crosses a railroad, FM 156, and Trail Creek. From this angle point, Link J4 proceeds in a southwesterly direction approximately 730 feet to an angle point. This segment of Link J4 crosses Trail Creek. From this angle point, Link J4 proceeds in a northwesterly direction approximately 1,850 feet to a slight angle point. This segment of Link J4 crosses Trail Creek. From this angle point, Link J4 proceeds in a southwesterly direction approximately 900 feet to a slight angle point. This segment of Link J4 crosses Boss Range Road and Trail Creek. From this angle point, Link J4 proceeds in a northwesterly direction approximately 610 feet to a slight angle point. This segment of Link J4 crosses Trail Creek and an unnamed stream. From this angle point, Link J4 proceeds in a westerly direction approximately 2,470 feet to the intersection of **Links J4 and K21**. This segment of Link J4 crosses a natural gas pipeline.

#### **Link J5**

From the intersection of **Links H5, J5, and J6**, Link J5 proceeds in a westerly direction approximately 970 feet to the intersection of **Links H9, J4, and J5**. Link J5 crosses Trail Creek.

#### **Link J6**

From the intersection of **Links H6 and J6**, Link J6 proceeds in a southerly direction approximately 3,320 feet to the intersection of **Links H5, J5, and J6**. Link J6 crosses two unnamed streams.

#### **Link K1**

From the intersection of **Links J3, K1, and K22**, Link K1 proceeds in a westerly direction approximately 1,320 feet to a slight angle point. This segment of Link K1 crosses four natural gas pipelines and Mary Polk Road. From this angle point, Link K1 proceeds in a northwesterly direction approximately 820 feet to a slight angle point. This segment of Link K1 crosses a natural gas pipeline and an unnamed stream. From this angle point, Link K1 proceeds in a westerly direction approximately 2,980 feet to the intersection of **Links K1, K62, and L5**. This segment of Link K1 crosses seven natural gas pipelines and an unnamed stream.

#### **Link K21**

From the intersection of **Links J4 and K21**, Link K21 proceeds in a southerly direction approximately 1,570 feet to the intersection of **Links K21, K22 and K61**. Link K21 crosses Trail Creek, two natural gas pipelines, and an unnamed stream.

#### **Link K22 (bi-directional)**

From the intersection of **Links K21, K22 and K61**, Link K22 proceeds in a southerly direction approximately 2,200 feet to the intersection of **Links J3, K1, and K22**. Link K22 crosses Range Road and a natural gas pipeline.

#### **Link K61**

From the intersection of **Links K21, K22 and K61**, Link K61 proceeds in a westerly direction approximately 5,090 feet to the intersection of **Links K61, K62 and M8**. Link K61 crosses two unnamed streams and eight natural gas pipelines.



#### Link K62

From the intersection of **Links K61, K62 and M8**, Link K62 proceeds in a southerly direction approximately 1,860 feet to the intersection of **Links K1, K62, and L5**. Link K62 crosses an unnamed stream and a natural gas pipeline.

#### Link L1

From the intersection of **Links I12, J22, and L1**, Link L1 proceeds in a northwesterly direction approximately 1,070 feet to an angle point. This segment of Link L1 crosses a railroad and Harriet Creek twice. From this angle point, Link L1 proceeds in a westerly direction approximately 1,420 feet to an angle point. This segment of Link L1 crosses a natural gas pipeline. From this angle point, Link L1 proceeds in a northwesterly direction approximately 810 feet to an angle point. This segment of Link L1 crosses Harriet Creek. From this angle point, Link L1 proceeds in a westerly direction approximately 1,540 feet to the intersection of **Links L1, L2, and L3**. This segment of Link L1 crosses Winding Meadows Drive and a natural gas pipeline.

#### Link L2

From the intersection of **Links L1, L2, and L3**, Link L2 proceeds in a westerly direction approximately 770 feet to a slight angle point. From this angle point, Link L2 proceeds in a westerly direction approximately 1,010 feet to the intersection of **Links L2, M1, and M6**. This segment of Link L2 crosses three natural gas pipelines.

#### Link L3 (bi-directional)

From the intersection of **Links L1, L2, and L3**, Link L3 proceeds in a northerly direction approximately 1,150 feet to an angle point. This segment of Link L3 crosses Harriet Creek. From this angle point, Link L3 proceeds in a northwesterly direction approximately 600 feet to an angle point. From this angle point, Link L3 proceeds in a northeasterly direction approximately 600 feet to an angle point. This segment of Link L3 crosses two natural gas pipelines. From this angle point, Link L3 proceeds in a northerly direction paralleling the west side of Sam Reynolds Road approximately 1,170 feet to the intersection of **Links L3, L4, and M7**. This segment of Link L3 crosses three natural gas pipelines.

#### Link L4 (bi-directional)

From the intersection of **Links L4 and L5**, Link L4 proceeds in a southerly direction approximately 2,730 feet to the intersection of **Links L3, L4, and M7**. Link L4 crosses Sam Reynolds Road.

#### Link L5

From the intersection of **Links K1, K62, and L5**, Link L5 proceeds in a southerly direction approximately 1,170 feet to an angle point. This segment of Link L5 crosses an unnamed stream and refined liquid product pipeline. From this angle point, Link L5 proceeds in a westerly direction approximately 2,620 feet to the intersection of **Links L4 and L5**. This segment of Link L5 crosses a natural gas pipeline.

#### Link M1

From the intersection of **Links L2, M1, and M6**, Link M1 proceeds in a southerly direction approximately 4,220 feet to an angle point. This segment of M1 crosses an unnamed stream. From this angle point, Link M1 proceeds in a westerly direction parallel to the north side of SH 114 approximately 1,900 feet to an angle point. From this angle point, Link M1 proceeds in a southerly direction approximately 2,350 feet to the intersection of **Links M1, M2, and M5**. This segment of Link M1 crosses SH 114 and Elizabeth Creek.

### **Link M2**

From the intersection of **Links M1, M2, and M5**, Link M2 proceeds in a southerly direction approximately 2,410 feet to the intersection of **Links M2, M3, and M4**. Link M2 crosses five natural gas pipelines and an existing transmission line.

### **Link M3**

From the intersection of **Links M2, M3, and M4**, Link M3 proceeds in a southerly direction approximately 2,620 feet to an angle point. This segment of Link M3 crosses an unnamed stream and a crude oil pipeline. From this angle point, Link M3 proceeds in a southwesterly direction approximately 1,800 feet to an angle point. This segment of Link M3 crosses four natural gas pipelines and John Day Road. From this angle point, Link M3 proceeds in a southwesterly direction approximately 6,020 feet to an angle point. This segment of Link M3 crosses a natural gas pipeline. From this angle point, Link M3 proceeds in a westerly direction approximately 9,670 feet to the intersection of **Links M3, R3, and R4**. This segment of Link M3 crosses ten natural gas pipelines and two unnamed streams.

### **Link M4**

From the intersection of **Links M2, M3, and M4**, Link M4 proceeds in a generally westerly direction approximately 5,350 feet to an angle point. This segment of Link M4 crosses a crude oil pipeline, three natural gas pipelines, and an unnamed stream. From this angle point, Link M4 proceeds in a northwesterly direction approximately 1,790 feet to a slight angle point. This segment of Link M4 crosses three natural gas pipelines and John Day Road. From this angle point, Link M4 proceeds in a northwesterly direction approximately 1,130 feet to a slight angle point. This segment of Link M4 crosses a natural gas pipeline. From this angle point, Link M4 proceeds in a westerly direction generally parallel to the north side of Robin Road approximately 1,870 feet to an angle point. This segment of Link M4 crosses a natural gas pipeline and an unnamed stream. From this angle point, Link M4 proceeds in a southwest direction approximately 1,110 feet to an angle point. This segment of Link M4 crosses Robin Road and Warbler Lane. From this angle point, Link M4 proceeds in a southwesterly direction approximately 2,080 feet to an angle point. This segment of Link M4 crosses two natural gas pipelines and an unnamed stream. From this angle point, Link M4 proceeds in a southwest direction approximately 1,540 feet to an angle point. This segment of Link M4 crosses an unnamed stream. From this angle point, Link M4 proceeds in a westerly direction approximately 3,340 feet to the intersection of **Links M4, R2, R3, and R5**. This segment of Link M4 crosses six natural gas pipelines.

### **Link M5**

From the intersection of **Links M1, M2, and M5**, Link M5 proceeds in a westerly direction approximately 11,130 feet to an angle point. This segment of Link M5 crosses seven natural gas pipelines, one unnamed stream three times, a crude oil pipeline, John Day Road, and two additional unnamed streams. From this angle point, Link M5 proceeds in a southwest direction approximately 510 feet to an angle point. This segment of Link M5 crosses a natural gas pipeline and an existing transmission line. From this angle point, Link M5 proceeds in a westerly direction approximately 5,240 to the intersection of **Links M5, R1, R2, and R6**. This segment of Link M5 crosses eight natural gas pipelines and an unnamed stream.

#### Link M6

From the intersection of **Links L2, M1, and M6**, Link M6 proceeds in a westerly direction approximately 840 feet to a slight angle point. From this angle point, Link M6 proceeds in a southwesterly direction approximately 4,140 feet to an angle point. This segment of Link M6 crosses a natural gas pipeline and an unnamed stream. From this angle point, Link M6 proceeds in a northwesterly direction approximately 960 feet to an angle point. This segment of Link M6 crosses a natural gas pipeline. From this angle point, Link M6 proceeds in a westerly direction approximately 1,560 feet to the intersection of **Links M6, O1, and O5**. This segment of Link M6 crosses two natural gas pipelines.

#### Link M7

From the intersection of **Links L3, L4, and M7**, Link M7 proceeds in a generally westerly direction approximately 8,370 feet to the intersection of **Links M7, O1, O2, and O7**. Link M7 crosses Harriet Creek six times and four natural gas pipelines.

#### Link M8

From the intersection of **Links K61, K62 and M8**, Link M8 proceeds in a southwesterly direction approximately 4,640 feet to an angle point. This segment of Link M8 crosses an unnamed stream, a natural gas pipeline, and Sam Reynolds Road. From this angle point, Link M8 proceeds in a westerly direction approximately 6,170 feet to the intersection of **Links M8, O2, and O3**. This segment of Link M8 crosses a refined liquid product pipeline, two natural gas pipelines, three unnamed streams, and Dalrymple Lane.

#### Link O1

From the intersection of **Links M7, O1, O2, and O7**, Link O1 proceeds in a southwesterly direction approximately 3,590 feet to the intersection of **Links M6, O1, and O5**. Link O1 crosses Harriet Creek.

#### Link O2

From the intersection of **Links M8, O2, and O3**, Link O2 proceeds in a southerly direction approximately 3,790 feet to an angle point. This segment of Link O2 crosses an unnamed stream and two natural gas pipelines. From this angle point, Link O2 proceeds in a southwesterly direction approximately 1,430 feet to the intersection of **Links M7, O1, O2, and O7**. This segment of Link O2 crosses three natural gas pipelines.

#### Link O3

From the intersection of **Links M8, O2, and O3**, Link O3 proceeds in a northerly direction approximately 490 feet to an angle point. From this angle point, Link O3 proceeds in a northwesterly direction approximately 850 feet to an angle point. From this angle point, Link O3 proceeds in a northerly direction approximately 680 feet to the intersection of **Links O3 and O8**. This segment of Link O3 crosses two natural gas pipelines and Dove Hollow Lane.

#### Link O5

From the intersection of **Links M6, O1, and O5**, Link O5 proceeds in a westerly direction approximately 1,950 feet to an angle point. This segment of Link O5 crosses two natural gas pipelines, an unnamed stream, and a crude oil pipeline. From this angle point, Link O5 proceeds in a southwesterly direction approximately 470 feet to an angle point. This segment of Link O5 crosses an unnamed stream and a natural gas pipeline. From this angle point, Link O5 proceeds in a westerly direction approximately 2,770 feet to the intersection of **Links O5, O6, and P3**.

#### **Link O6**

From the intersection of **Links O5, O6, and P3**, Link O6 proceeds in a southerly direction approximately 1,850 feet to the intersection of **Links O6 and P1**. Link O6 crosses two natural gas pipelines.

#### **Link O7**

From the intersection of **Links M7, O1, O2, and O7**, Link O7 proceeds in a westerly direction approximately 5,040 feet to a slight angle point. This segment of Link O7 crosses Harriet Creek three times, a natural gas pipeline, and a crude oil pipeline. From this angle point, Link O7 proceeds in a southwesterly direction approximately 630 feet to a slight angle point. From this angle point, Link O7 proceeds in a westerly direction approximately 970 feet to the intersection of **Links O7, P7, and Q1**. This segment of Link O7 crosses S County Line Road and two natural gas pipelines.

#### **Link O8**

From the intersection of **Links O3 and O8**, Link O8 proceeds in a westerly direction approximately 4,300 feet to an angle point. This segment of Link O8 crosses two unnamed streams. From this angle point, Link O8 proceeds in a northwesterly direction approximately 1,140 feet to the intersection of **Links O8 and Q2**.

#### **Link P1**

From the intersection of **Links O6 and P1**, Link P1 proceeds in a southeasterly direction approximately 670 feet to a slight angle point. This segment of Link P1 crosses an unnamed stream. From this angle point, Link P1 proceeds in a southerly direction approximately 760 feet to an angle point. From this angle point, Link P1 proceeds in a westerly direction approximately 4,130 feet to an angle point. This segment of Link P1 crosses S County Line Road, Shale Creek Boulevard, and five natural gas pipelines. From this angle point, Link P1 proceeds in a northerly direction approximately 1,250 feet to the intersection of **Links P1, P4, and R1**. This segment of Link P1 crosses four natural gas pipelines.

#### **Link P3**

From the intersection of **Links O5, O6, and P3**, Link P3 proceeds in a northerly direction approximately 1,580 feet to an angle point. From this angle point, Link P3 proceeds in a westerly direction approximately 2,840 feet to the intersection of **Links P3, P5, and P6**. This segment of Link P3 crosses S County Line Road, five natural gas pipelines, and an unnamed stream.

#### **Link P4**

From the intersection of **Links P4, P5, and S1**, Link P4 proceeds in a southerly direction approximately 2,290 feet to an angle point. From this angle point, Link P4 proceeds in a westerly direction approximately 1,210 feet to the intersection of **Links P1, P4, and R1**. This segment of Link P4 crosses three natural gas pipelines.

#### **Link P5**

From the intersection of **Links P3, P5, and P6**, Link P5 proceeds in a southerly direction approximately 1,320 feet to the intersection of **Links P4, P5, and S1**. Link P5 crosses two natural gas pipelines.

#### **Link P6 (bi-directional)**

From the intersection of **Links P6, P7, and S2**, Link P6 proceeds in a southerly direction approximately 2,220 feet to the intersection of **Links P3, P5, and P6**. Link P6 crosses an unnamed stream.

#### **Link P7**

From the intersection of **Links O7, P7, and Q1**, Link P7 proceeds in a westerly direction approximately 1,880 feet to the intersection of **Links P6, P7, and S2**. Link P7 crosses three natural gas pipelines.

#### **Link Q1**

From the intersection of **Links Q1, Q2, and Q5**, Link Q1 proceeds in a southerly direction approximately 5,360 feet to the intersection of **Links O7, P7, and Q1**. Link Q1 crosses three natural gas pipelines, Harriet Creek, W County Line Road, and a crude oil pipeline.

#### **Link Q2**

From the intersection of **Links Q2 and O8**, Link Q2 proceeds in a westerly direction approximately 990 feet to an angle point. This segment of Link Q2 crosses two natural gas pipelines and S County Line Road. From this angle point, Link Q2 proceeds in a southerly direction approximately 1,990 feet to the intersection of **Links Q1, Q2, and Q5**.

#### **Link Q5**

From the intersection of **Links Q1, Q2, and Q5**, Link Q5 proceeds in a westerly direction approximately 4,480 feet to an angle point. This segment of Link Q5 crosses an unnamed stream, a crude oil pipeline, three natural gas pipelines, and Harriet Creek. From this angle point, Link Q5 proceeds in a northwesterly direction approximately 680 feet to an angle point. From this angle point, Link Q5 proceeds in a westerly direction approximately 2,800 feet to a slight angle point. This segment of Link Q5 crosses CR 4717 and a natural gas pipeline. From this angle point, Link Q5 proceeds in a northwesterly direction approximately 3,130 feet to the intersection of **Links Q5, T1, and T2**. This segment of Link Q5 crosses a natural gas pipeline.

#### **Link R1**

From the intersection of **Links P1, P4, and R1**, Link R1 proceeds in a westerly direction approximately 2,460 feet to an angle point. This segment of Link R1 crosses Elizabeth Creek and an existing transmission line. From this angle point, Link R1 proceeds in a southerly direction approximately 4,390 feet to the intersection of **Links M5, R1, R2, and R6**. This segment of Link R1 crosses an unnamed stream, four natural gas pipelines, SH 114, and an existing transmission line.

#### **Link R2**

From the intersection of **Links M5, R1, R2, and R6**, Link R2 proceeds in a southerly direction approximately 3,310 feet to the intersection of **Links M4, R2, R3, and R5**. Link R2 crosses two unnamed streams and four natural gas pipelines.

#### **Link R3**

From the intersection of **Links M3, R3, and R4**, Link R3 proceeds in a northerly direction approximately 4,060 feet to the intersection of **Links M4, R2, R3, and R5**. Link R3 crosses a natural gas pipeline.

#### **Link R4**

From the intersection of **Links M3, R3, and R4**, Link R4 proceeds in a northwesterly direction approximately 1,500 feet to an angle point. This segment of Link R4 crosses an unnamed stream and a natural gas pipeline. From this angle point, Link R4 proceeds in a westerly direction approximately 3,470 feet to the intersection of **Links R4, V1, and V2**. This segment of Link R4 crosses a natural gas pipeline.

#### **Link R5**

From the intersection of **Links M4, R2, R3, and R5**, Link R5 proceeds in a westerly direction approximately 5,850 feet to the intersection of **Links R5, U2, and U3**. Link R5 crosses an unnamed stream and a natural gas pipeline.

#### **Link R6**

From the intersection of **Links M5, R1, R2, and R6**, Link R6 proceeds in a westerly direction approximately 2,080 feet to an angle point. This segment of Link R6 crosses an unnamed stream and a natural gas pipeline. From this angle point, Link R6 proceeds in a northwesterly direction approximately 630 feet to an angle point. From this angle point, Link R6 proceeds in a westerly direction approximately 3,230 feet to the intersection of **Links R6, U1, and U2**. This segment of Link R6 crosses an unnamed stream.

#### **Link S1**

From the intersection of **Links P4, P5, and S1**, Link S1 proceeds in a westerly direction approximately 6,140 feet to the intersection of **Links S1, S3, and S4**. Link S1 crosses three natural gas pipelines, an existing transmission line, and Elizabeth Creek.

#### **Link S2**

From the intersection of **Links P6, P7, and S2**, Link S2 proceeds in a westerly direction approximately 620 feet to an angle point. From this angle point, Link S2 proceeds in a northwesterly direction approximately 2,780 feet to an angle point. This segment of Link S2 crosses a natural gas pipeline and an unnamed stream. From this angle point, Link S2 proceeds in a westerly direction approximately 1,570 feet to an angle point. From this angle point, Link S2 proceeds in a southwesterly direction approximately 1,210 feet to the intersection of **Links S2, S3, and S5**.

#### **Link S3**

From the intersection of **Links S2, S3, and S5**, Link S3 proceeds in a southwesterly direction approximately 3,720 feet to the intersection of **Links S1, S3, and S4**. Link S3 crosses an existing transmission line and Elizabeth Creek.

#### **Link S4**

From the intersection of **Links S1, S3, and S4**, Link S4 proceeds in a westerly direction approximately 1,800 feet to an angle point. From this angle point, Link S4 proceeds in a southwesterly direction approximately 910 feet to the intersection of **Links S4, T4, and U1**. This segment of Link S4 crosses a natural gas pipeline.

#### **Link S5**

From the intersection of **Links S2, S3, and S5**, Link S5 proceeds in a westerly direction approximately 3,740 feet to the intersection of **Links S5, T1, and T3**. Link S5 crosses an existing transmission line and Elizabeth Creek.

#### Link T1

From the intersection of **Links Q5, T1, and T2**, Link T1 proceeds in a southerly direction approximately 5,450 feet to the intersection of **Links S5, T1, and T3**. This segment of Link T1 crosses three natural gas pipelines, Hickory Street, an existing transmission line, and Elizabeth Creek.

#### Link T2

From the intersection of **Links Q5, T1, and T2**, Link T2 proceeds in a westerly direction approximately 2,640 feet to an angle point. This segment of Link T2 crosses a natural gas pipeline, an unnamed stream, and CR 4733. From this angle point, Link T2 proceeds in a southwesterly direction approximately 2,910 feet to a slight angle point. This segment of Link T2 crosses an existing transmission line, an unnamed stream, a natural gas pipeline, and Elizabeth Creek. From this angle point, Link T2 proceeds in a southwesterly direction approximately 1,480 feet to a slight angle point. From this angle point, Link T2 proceeds in a southwesterly direction approximately 3,600 feet to the intersection of **Links T2, T3, and T5**. This segment of Link T2 crosses Hickory Street and an unnamed stream.

#### Link T3

From the intersection of **Links S5, T1, and T3**, Link T3 proceeds in a southwesterly direction approximately 760 feet to a slight angle point. From this slight angle point, Link T3 proceeds in a northwesterly direction approximately 590 feet to a slight angle point. From this angle point, Link T3 proceeds in a westerly direction approximately 1,090 feet to an angle point. From this angle point, Link T3 proceeds in a southwesterly direction approximately 870 feet to an angle point. This segment of Link T3 crosses a natural gas pipeline. From this angle point, Link T3 proceeds in a westerly direction approximately 4,650 feet to the intersection of **Links T2, T3, and T5**. This segment of Link T3 crosses an unnamed stream.

#### Link T4

From the intersection of **Links S4, T4, and U1**, Link T4 proceeds in a northwesterly direction approximately 1,060 feet to an angle point. This segment of Link T4 crosses a natural gas pipeline and two unnamed streams. From this angle point, Link T4 proceeds in a western direction approximately 3,980 feet to an angle point. This segment of Link T4 crosses an unnamed stream four times, a natural gas pipeline, and an additional unnamed stream. From this angle point, Link T4 proceeds in a southwesterly direction approximately 720 feet to an angle point. From this angle point, Link T4 proceeds in a westerly direction approximately 2,040 feet to the intersection of **Links T4, T5, and W1**. This segment of Link T4 crosses an unnamed stream.

#### Link T5

From the intersection of **Links T2, T3, and T5**, Link T5 proceeds in a southerly direction approximately 2,760 feet to the intersection of **Links T4, T5, and W1**. Link T5 crosses a natural gas pipeline.

#### Link U1

From the intersection of **Links S4, T4, and U1**, Link U1 proceeds in a southwesterly direction approximately 560 feet to an angle point. From this angle point, Link U1 proceeds in a southerly direction approximately 5,880 feet to an angle point. This segment of Link U1 crosses three natural gas pipelines, SH 114, and an existing transmission line. From this angle point, Link U1 proceeds in a southwesterly direction approximately 530 feet to the intersection of **Links R6, U1, and U2**.

#### Link U2

From the intersection of **Links R6, U1, and U2**, Link U2 proceeds in a southerly direction approximately 1,950 feet to an angle point. This segment of Link U2 crosses two natural gas pipelines, two unnamed streams, and CR 4840. From this angle point, Link U2 proceeds in a southeasterly direction approximately 770 feet to an angle point. From this angle point, Link U2 proceeds in a southerly direction approximately 720 feet to the intersection of **Links R5, U2, and U3**.

#### Link U3

From the intersection of **Links R5, U2, and U3**, Link U3 proceeds in a westerly direction approximately 1,300 feet to an angle point. This segment of Link U3 crosses a natural gas pipeline. From this angle point, Link U3 proceeds in a southwesterly direction approximately 600 feet to the intersection of **Links U3, V1, V3, and W5**.

#### Link V1

From the intersection of **Links R4, V1, and V2**, Link V1 proceeds in a northwesterly direction parallel to the east side of a railroad approximately 4,260 feet to the intersection of **Links U3, V1, V3, and W5**. Link V1 crosses a natural gas pipeline twice.

#### Link V2

From the intersection of **Links R4, V1, and V2**, Link V2 proceeds in a southwesterly direction approximately 460 feet to an angle point. This segment of Link V2 crosses CR 4923, a railroad, CR 4925, and a natural gas pipeline. From this angle point, Link V2 proceeds in a westerly direction approximately 2,340 feet to an angle point. This segment of Link V2 crosses two natural gas pipelines and an unnamed stream. From this angle point, Link V2 proceeds in a southwesterly direction approximately 440 feet to an angle point. This segment of Link V2 crosses US 81/287. From this angle point, Link V2 proceeds in a westerly direction approximately 3,440 feet to an angle point. This segment of Link V2 crosses an unnamed stream and a natural gas pipeline. From this angle point, Link V2 proceeds in a northerly direction approximately 2,430 feet to the intersection of **Links V2, V4, and Z**. This segment of Link V2 crosses CR 4843 and an unnamed stream three times.

#### Link V3

From the intersection of **Links U3, V1, V3, and W5**, Link V3 proceeds in a southwesterly direction approximately 810 feet to an angle point. This segment of Link U3 crosses a railroad, CR 4925, and CR 4843. From this angle point, Link V3 proceeds in a southwesterly direction approximately 2,050 feet to an angle point. This segment of Link V3 crosses a natural gas pipeline and US 81/287. From this angle point, Link V3 proceeds in a westerly direction approximately 690 feet to the intersection of **Links V3, V4, and X**.

#### Link V4

From the intersection of **Links V3, V4, and X**, Link V4 proceeds in a westerly direction approximately 580 feet to the intersection of **Links V2, V4, and Z**. Link V4 crosses an unnamed stream.



#### Link W1

From the intersection of **Links T4, T5, and W1**, Link W1 proceeds in a southwesterly direction approximately 2,250 feet to an angle point. This segment of Link W1 crosses an unnamed stream and SH 114. From this angle point, Link W1 proceeds in a southwesterly direction approximately 710 feet to the intersection of **Links W1, W3, and W4**. This segment of Link W1 crosses a railroad and US 81/287.

#### Link W3

From the intersection of **Links W1, W3, and W4**, Link W3 proceeds in a southeasterly direction approximately 1,160 feet to an angle point. This segment of Link W3 crosses two natural gas pipelines and an existing transmission line. From this angle point, Link W3 proceeds in a southerly direction approximately 6,260 feet to the intersection of **Links W3 and W6**. This segment of Link W3 crosses a natural gas pipeline.

#### Link W4

From the intersection of **Links W1, W3, and W4**, Link W4 proceeds in a southeasterly direction approximately 1,270 feet to a slight angle point. This segment of Link W4 crosses two natural gas pipelines and an existing transmission line. From this angle point, Link W4 proceeds in a southeasterly direction parallel to the west side of US 81/US 287 approximately 6,320 feet to the intersection of **Links W4, W5, and W7**. This segment of Link W4 crosses Mary's Drive and a natural gas pipeline.

#### Link W5

From the intersection of **Links U3, V1, V3, and W5**, Link W5 proceeds in a northwesterly direction parallel to the east side of a railroad approximately 2,430 feet to an angle point. This segment of Link W5 crosses a natural gas pipeline. From this angle point, Link W3 proceeds in a southwesterly direction approximately 780 feet to the intersection of **Links W4, W5, and W7**. This segment of Link W5 crosses a natural gas pipeline, a railroad, CR 4925, and US 81/287.

#### Link W6

From the intersection of **Links W3 and W6**, Link W6 proceeds in an easterly direction approximately 2,130 feet to an angle point. This segment of Link W6 crosses Moss Branch. From this angle point, Link W6 proceeds in a southeasterly direction approximately 670 feet to the intersection of **Links W6, W7, and X**.

#### Link W7

From the intersection of **Links W4, W5, and W7**, Link W7 proceeds in a southwesterly direction approximately 1,620 feet to the intersection of **Links W6, W7, and X**.

#### Link X

From the intersection of **Links W6, W7, and X**, Link X proceeds in a southerly direction approximately 1,360 feet to intersection of **Links V3, V4, and X**. Link X crosses an unnamed stream.

#### Link Z

From the intersection of **Links V2, V4, and Z**, Link Z proceeds in a westerly direction approximately 600 feet to the Ramhorn Hill Switch.

***Application of Oncor Electric Delivery Company LLC to Amend its Certificate of Convenience and Necessity for the Ramhorn Hill Switch – Dunham Switch 345 kV Transmission Line Project in Denton and Wise Counties, Texas***

**PUBLIC UTILITY COMMISSION OF TEXAS DOCKET NO. 55067**

*DOD Siting Clearinghouse, OPUC, Utility, County, or Municipal Contact Name*

This notice is provided to notify you that Oncor Electric Delivery Company LLC (“Oncor”) has applied to amend its certificate of convenience and necessity to construct, own, and operate a new double-circuit 345 kV transmission line on triple-circuit capable structures between the proposed Ramhorn Hill Switch and the proposed Dunham Switch. The structures will have two 345 kV circuits initially installed with a vacant third circuit position capable of accommodating a future 138 kV circuit.

The proposed Ramhorn Hill Switch will be located approximately 2 miles south of the intersection of United States Highway (“US”) 287 and State Highway (“SH”) 114 near Rhome, Texas. The proposed Dunham Switch will be located approximately 1.4 miles southeast of the intersection of US 377 and Farm-to-Market Road (“FM”) 1171 (regionally known as Cross Timbers Road) in Flower Mound, Texas. The length of the Proposed Transmission Line Project is approximately 20 to 23 miles, depending on which route is selected by the Public Utility Commission of Texas (“PUC”).

If you have questions about this project, please contact Chris Reily of Oncor at (214) 486-4717.

A detailed routing map may be reviewed at the following locations:

<b>Display Location</b>	<b>Address</b>
Rhome City Hall	501 South Main Street Rhome, TX 76078
Flower Mound Town Hall	2121 Cross Timbers Road Flower Mound, TX 75028

***All routes and route segments included in this notice are available for selection and approval by the Public Utility Commission of Texas.***

The preferred method for you to file your request for intervention is electronically. If you decide to file an electronic request for intervention, you will be required to serve the request on all other parties by email. Therefore, please include your own email address on the intervention form. Instructions for electronic filing via the “PUC Filer” on the PUC’s website can be found here: <https://interchange.puc.texas.gov/filer>. Instructions for using the PUC Filer are available at [https://ftp.puc.texas.gov/public/puct-info/industry/filings/E-Filing\\_Instructions.pdf](https://ftp.puc.texas.gov/public/puct-info/industry/filings/E-Filing_Instructions.pdf). For assistance with your electronic filing, please contact the PUC’s Help Desk at (512) 936-7100 or [helpdesk@puc.texas.gov](mailto:helpdesk@puc.texas.gov). You can review materials filed in this docket on the PUC Interchange at: <http://interchange.puc.texas.gov>.

While the preferred method for submitting a request for intervention is electronically, you may file your request for intervention by mailing a hard copy of your request to the PUC. Any request must be received by the intervention deadline of **July 24, 2023**. If you are not filing your request for intervention electronically, the PUC's rules require you to mail the request for intervention and 10 copies of the request to:

Public Utility Commission of Texas  
Central Records  
Attn: Filing Clerk  
1701 N. Congress Avenue  
P.O. Box 13326  
Austin, Texas 78711-3326

Persons who wish to intervene in the docket must also email or mail a copy of their request for intervention to all parties in the docket and all persons who have pending motions to intervene, at or before the time the request for intervention is electronically filed with, or mailed to, the PUC. ***The only way to fully participate in the PUC's decision on where to locate the transmission line is to intervene in the docket. It is important for an affected person to intervene because the utility is not obligated to keep affected persons informed of the PUC's proceedings and cannot predict which route may or may not be approved by the PUC.***

The deadline for intervention in the docket is **July 24, 2023**, and the PUC must receive a letter from you requesting intervention by that date if you choose to intervene.

The PUC has a brochure titled "Landowners and Transmission Line Cases at the PUC." Copies of the brochure may be requested by contacting Chris Reily of Oncor at (214) 486-4717 or may be downloaded from the PUC's website at [www.puc.state.tx.us](http://www.puc.state.tx.us). To obtain additional information about this docket, you may contact the PUC's Customer Assistance Hotline at (512) 936-7120 or (888) 782-8477. Hearing- and speech-impaired individuals with text telephones (TTY) may contact the PUC's Customer Assistance Hotline at (512) 936-7136 or toll free at (800) 735-2989. In addition to the intervention deadline, other important deadlines may exist that affect your participation in this docket. As such, you should review the orders and other filings made in the docket.

Enclosures:

- Route Composition, Route Description, and Maps

The following files are not convertible:

Att. 13b Composition of Routes.xlsx

Please see the ZIP file for this Filing on the PUC Interchange in order to access these files.

Contact [centralrecords@puc.texas.gov](mailto:centralrecords@puc.texas.gov) if you have any questions.